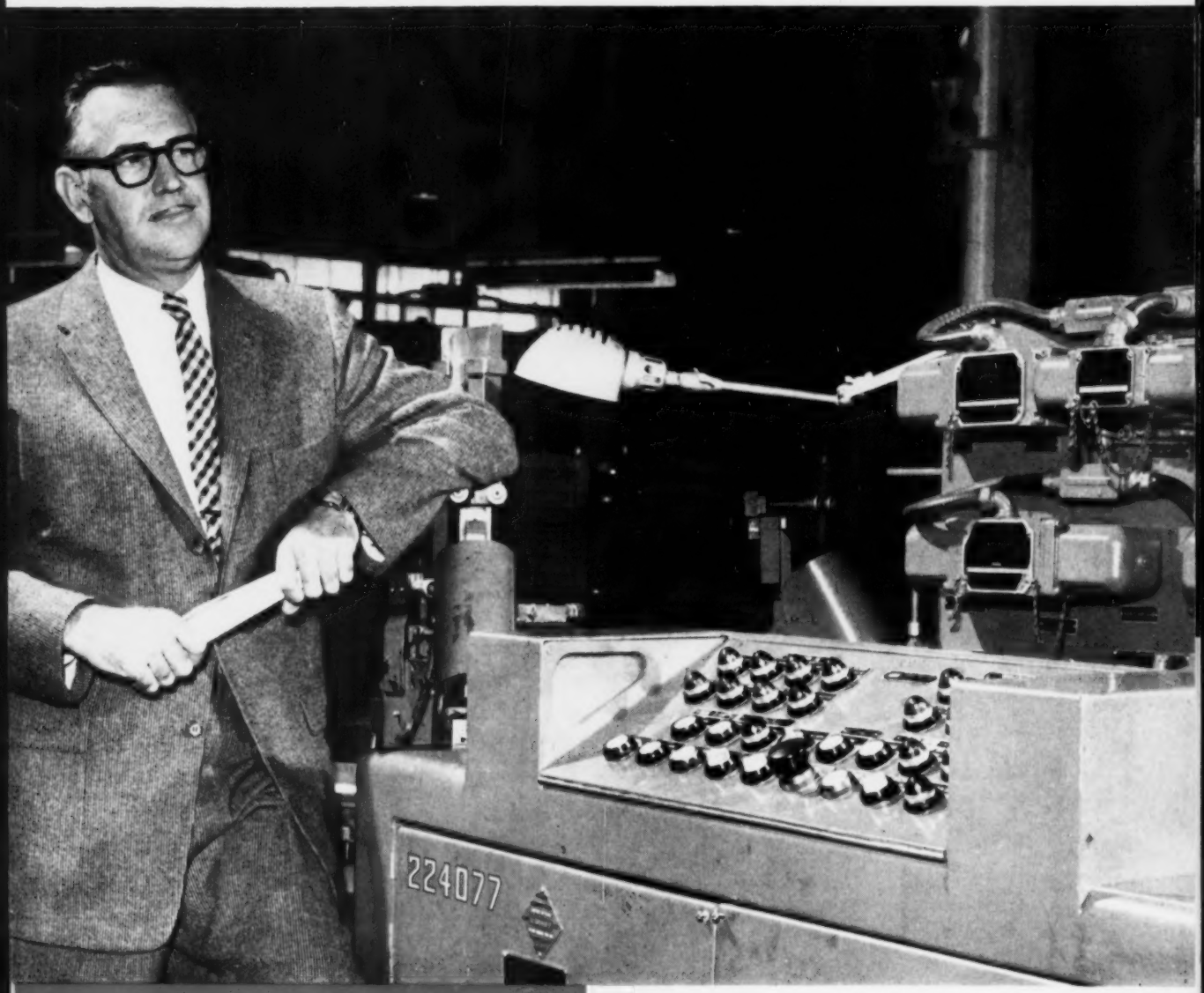
The IRON AGE
September 26, 1957 A Chilton Publication The National Metalworking Weekly



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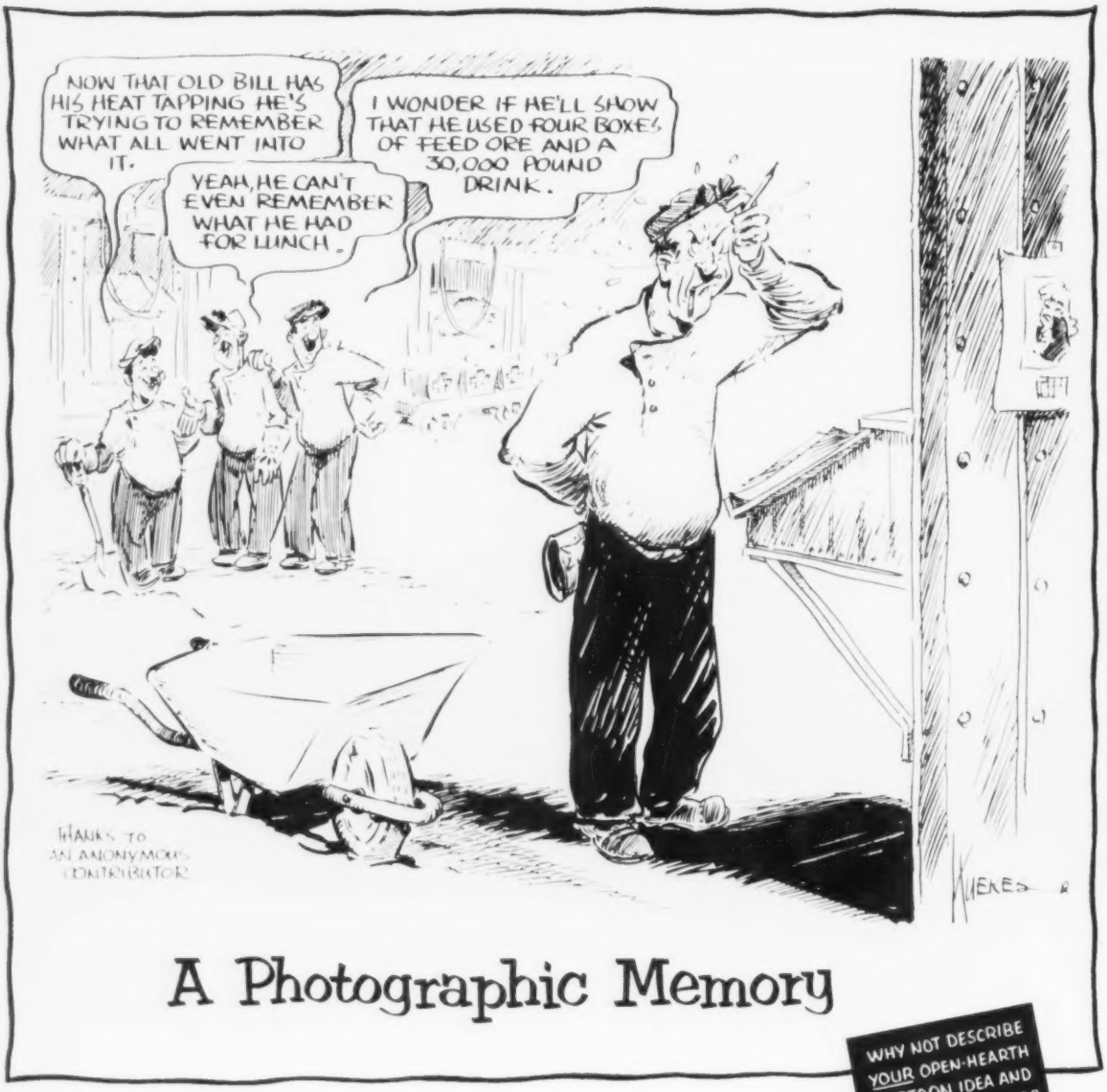
NOW THAT OLD BILL HAS HIS HEAT TAPPING HE'S TRYING TO REMEMBER WHAT ALL WENT INTO IT.
YEAH, HE CAN'T EVEN REMEMBER WHAT HE HAD FOR LUNCH.
I WONDER IF HE'LL SHOW THAT HE USED FOUR BOXES OF FEED ORE AND A 30,000 POUND DRINK.
THANKS TO AN ANONYMOUS CONTRIBUTOR
KUEKES

A Photographic Memory

WHY NOT DESCRIBE YOUR OPEN-HEARTH CARTOON IDEA AND SEND IT ALONG TO US?

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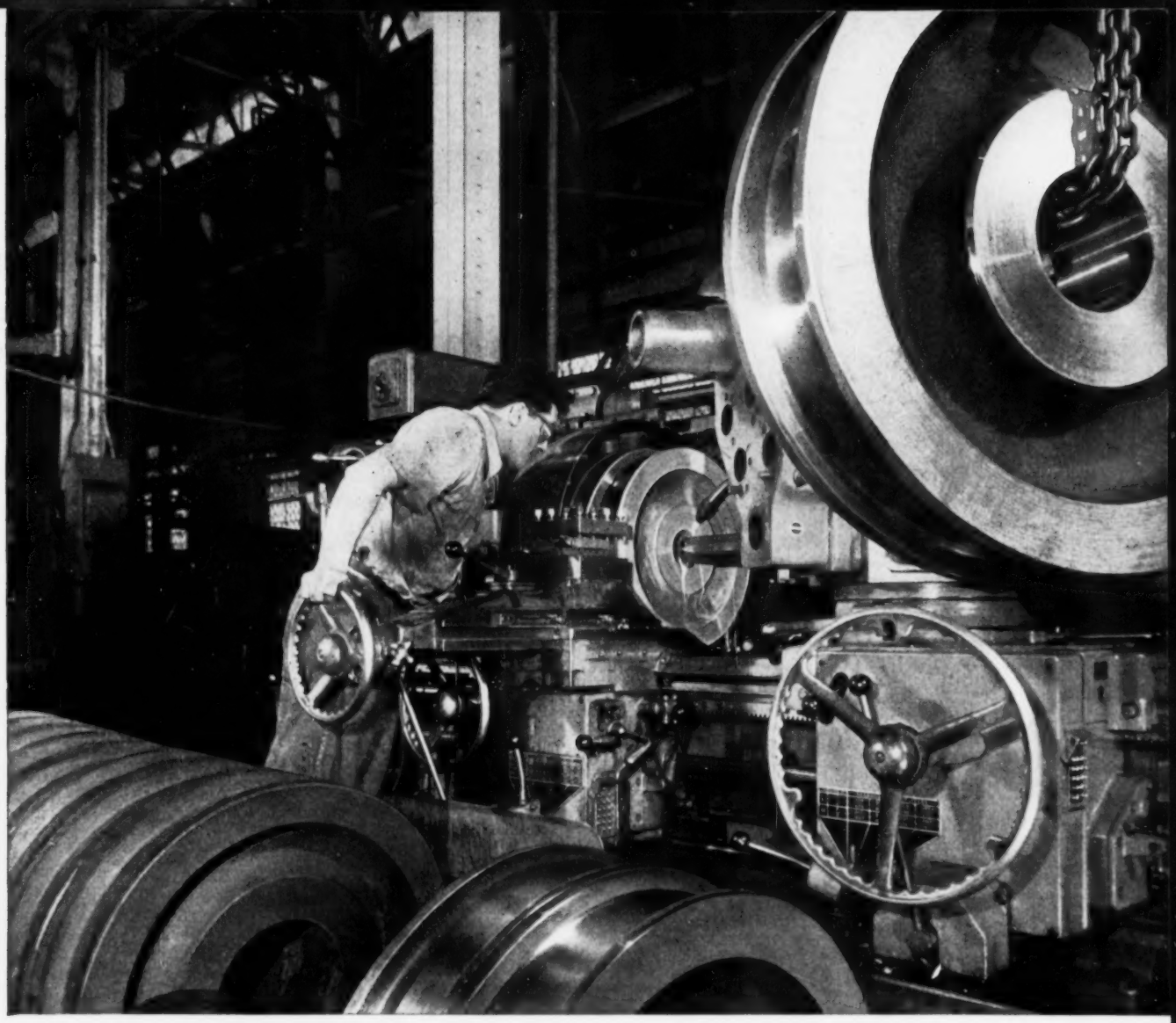

Thirty-Ton Cranes Will Roll on These Sturdy Wheels

This is a part of the machine shop of Industrial Crane & Hoist, Ingersoll Products Division, Borg-Warner Corporation, Chicago. Those big double-flange wheels, weighing 408 lb each and made from Bethlehem's tough, rugged circular forged blanks, will be used on bridge cranes that the company manufactures. The cranes have a capacity of thirty tons.

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Our nearest office will gladly give you full details. Or ask for a copy of Booklet 216, which contains many pertinent facts and photographs.

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Indexed in the Industrial Arts Index and the Engineering Index.

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The IRON AGE

September 26, 1957—Vol. 180, No. 13

Digest of the Week in

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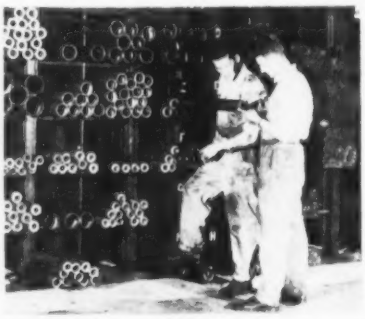
Close to the Vest—Inventory cutbacks are still the order of the day. But buyers admit they may be skating on thin ice. Cost-consciousness and tight money have important bearing on inventory policies. P. 75



MERGER BATTLE

Freight Barrier—Bethlehem and Youngstown Sheet & Tube Co. say freight rates make competition in steel regional rather than national. They make the point in rebuttal to Government arguments against their proposed merger. P. 78

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Study Under Way—Special study committee is hard at work on revision of Bulletin F. Revision of

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AUTOMATE OR NOT?: Solar Aircraft's Bruce A. Willsey offers some sound tips on small plant automation. For the little firm, he says, automation means a basic system for finding ways to produce faster and cheaper. P. 115

depreciation schedules may be out by next spring. Business response to study is described as "pretty good." P. 97

STOCKPILING

It's Fading Fast—Office of Defense Mobilization is looking into top level stockpiling policies. And more economy-minded congressmen are criticizing it. This may spell the end of U. S. buying of most strategic materials. P. 81

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Move Unit Loads Faster—The key to moving unitized loads from one floor to another is in the proper design and installation of interfloor conveyors. Trends and developments in conveying point to more versatility, greater loads, higher speeds and safer operation. P. 119

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By Direct-Reading Spectrograph—It's done with a pair of photomultipliers. By recording the typical pattern corresponding to each element on a strip chart, the instantaneous measurement allows for both quantitative and qualitative analysis. P. 124

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OMI Pays Off—Republic Steel's Order Makers Institute is a unique marketing tool for distributors and jobbers of pipe. Because of it, the company is pulling ahead of competition. P. 80

AUTOMAKERS

Top Metal Buyers—All things considered, 1957 was a good year for the auto industry. Unit sales will probably pass the 6.2 million mark. It adds up to heavy ferrous and non-ferrous metal purchases. P. 92

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BUILDING-BLOCK TOOLS

Under Study — Ford plan for building-block machine tools in mobilization sounds good. Theory is that beds, columns would be permanent devices. It could save time and money in an emergency. Builders have their reservations about practicality. P. 101

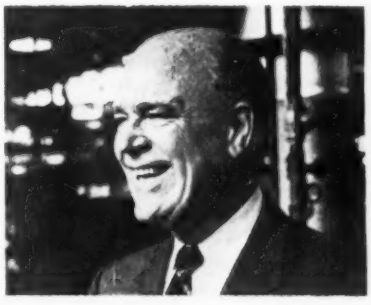
STEEL OUTLOOK

Take Your Pick—It all depends on how you look at it. From a short-term view, the steel market is disappointing. But if you look at the big picture, it's encouraging. P. 173

NEXT WEEK

PLANNING

For Future Growth—There are a number of ways a company can grow. But planning is a must. Next week Dana Corp. Pres. J. E. Martin gives his views on the best approach to take for the long-range pull.



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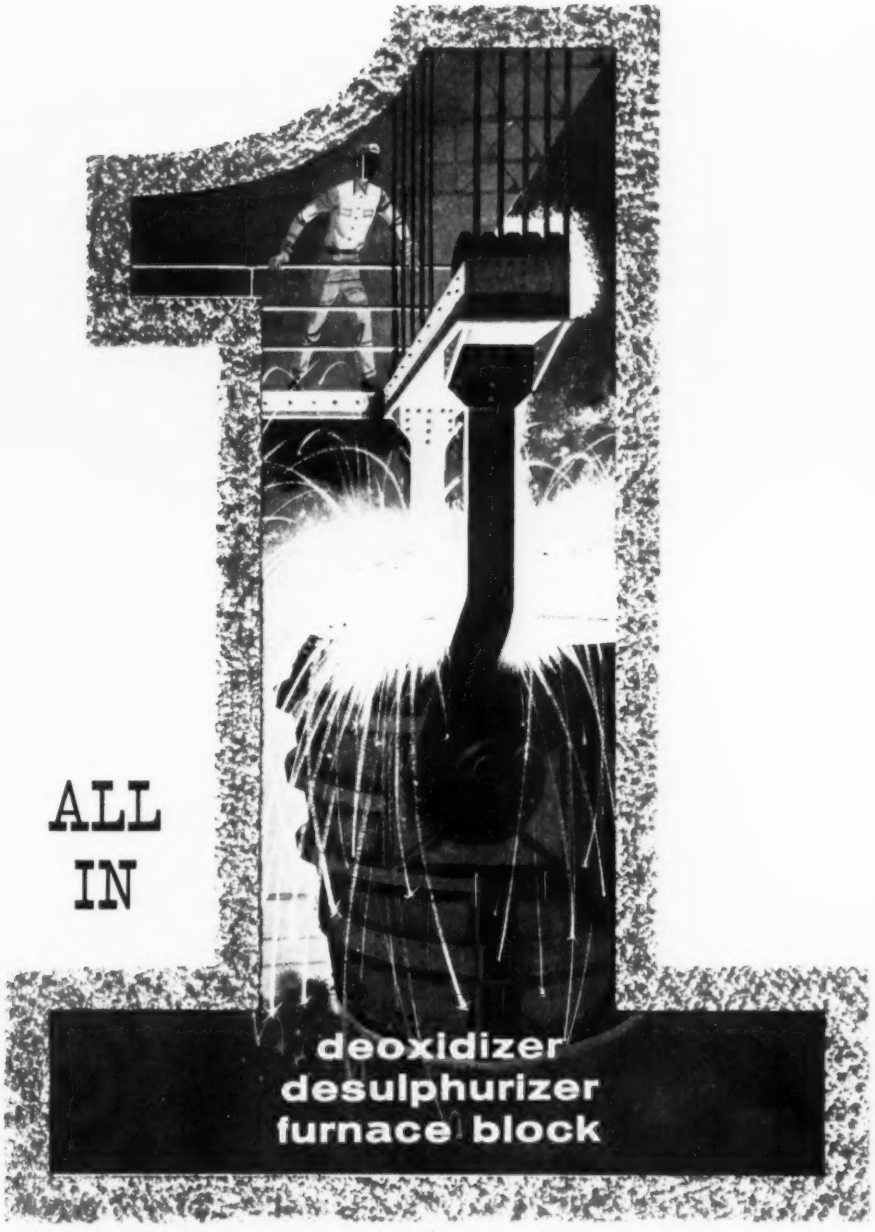

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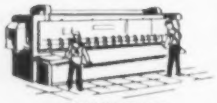

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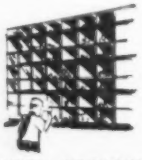

LARGE STOCKS

Key: (A) Sheet, Strip, Plate (B) Bar and Wire

ARIZONA
PHOENIX
Ducommun Metals & Supply Co. (B)

CALIFORNIA
BERKELEY
Ducommun Metals & Supply Co. (B)
EMERYVILLE
Electric Steel Foundry Co. (AB)
LOS ANGELES
Ducommun Metals & Supply Co. (B)
Electric Steel Foundry Co. (AB)
Jones & Laughlin Steel Corp. Strip Steel Division (AB)
NATIONAL CITY
Ducommun Metals & Supply Co. (B)

COLORADO
DENVER
C. A. Crosta, Inc. (A)
Metal Goods Corp. (AB)

CONNECTICUT
HARTFORD
The American Steel & Aluminum Corporation (AB)
Peter A. Frasse & Co., Inc. (AB)

FLORIDA
JACKSONVILLE
J. M. Tull Metal & Supply Co. (AB)
MIAMI
J. M. Tull Metal & Supply Co. (AB)
TAMPA
J. M. Tull Metal & Supply Co. (AB)

GEORGIA
ATLANTA
J. M. Tull Metal & Supply Co. (AB)

ILLINOIS
CHICAGO
Central Steel & Wire Co. (AB)
Chicago Steel Service Co. (B)

KANSAS
WICHITA
Metal Goods Corp. (AB)

LOUISIANA
NEW ORLEANS
Metal Goods Corp. (AB)
The Orleans Steel Prod. Co., Inc. (A)

MAINE
AUBURN
Brown-Wales Company (AB)

MARYLAND
BALTIMORE
Seaboard Steel & Iron Corp. (B)

MASSACHUSETTS
CAMBRIDGE
Brown-Wales Company (AB)
Industrial Stainless Steels, Inc. (B)
FALL RIVER
Congdon & Carpenter Co. (AB)

MICHIGAN
DETROIT
Central Steel & Wire Co. (AB)

MISSOURI
KANSAS CITY
Richards & Conover Steel Div. (A)
NORTH KANSAS CITY
Metal Goods Corp. (AB)
ST. LOUIS
Metal Goods Corp. (AB)
E. E. Souther Iron Co. (A)

NEBRASKA
OMAHA
Gate City Steel, Inc. (A)

NEW YORK
BUFFALO
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NEW YORK CITY
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Edgcomb Steel Co. (AB)

OHIO
CINCINNATI
Central Steel & Wire Co. (AB)
CLEVELAND
Cleveland Tool & Supply Co. (B)
Viking Steel Co. (AB)
COLUMBUS
Vorys Brothers, Inc. (AB)

OKLAHOMA
TULSA
Metal Goods Corp. (AB)

OREGON
EUGENE
Electric Steel Foundry Co. (AB)
PORTLAND
Electric Steel Foundry Co. (AB)

PENNSYLVANIA
PHILADELPHIA
Edgcomb Steel Co. (AB)
Peter A. Frasse & Co., Inc. (AB)
YORK
Edgcomb Steel Co. (A)
York Corrugating Co. (A)

RHODE ISLAND
PROVIDENCE
Congdon & Carpenter Co. (AB)

TENNESSEE
MEMPHIS
Metal Goods Corp. (AB)

TEXAS
DALLAS
Metal Goods Corp. (AB)
Moncrief-Lenoir Mfg. Co. (AB)
FORT WORTH
Maxwell Steel Co. (A)
HARLINGEN
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LUBBOCK
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The Defense Conundrum: When Do We Get an Answer?

If you are a bit confused about defense spending—don't be. There are millions like you and me. The picture won't be any clearer in the near future.

The Defense Dept. is trying to get the fat out of the budget without shriveling basic military strength. It is a tough job and only time will prove what's right.

We were spending at an annual rate of over $40 billion. The Administration is trying for a top of $38 billion. The problem: How to cut down. The solution: Since we were spending at a rate of $21 billion in the first half period we should cut to $17 billion in the second half. That adds up to $38 billion for a full year.

But it doesn't quite work out that way. This week, with all the talk, stretchouts, cancellations and plans for more cutting, we are still spending at a rate of $40 billion or more.

More cuts have been ordered. But that still won't be the answer. When you get close to the guts of the defense program, you have to stop, look and listen. While you are taking that precaution other things may boost the ante.

These factors are giving Mr. Wilson more white hair—and causing arguments galore. When you consider the price of materials, the cost of cancellations and stretchouts, and the need for more atomic and missile defense, the total tab goes up, not down.

It is hard to visualize $4 billion, let alone $38 billion. It is hard to cut a budget which is composed of such big figures, so many details, variable factors and which is also the result of human judgment.

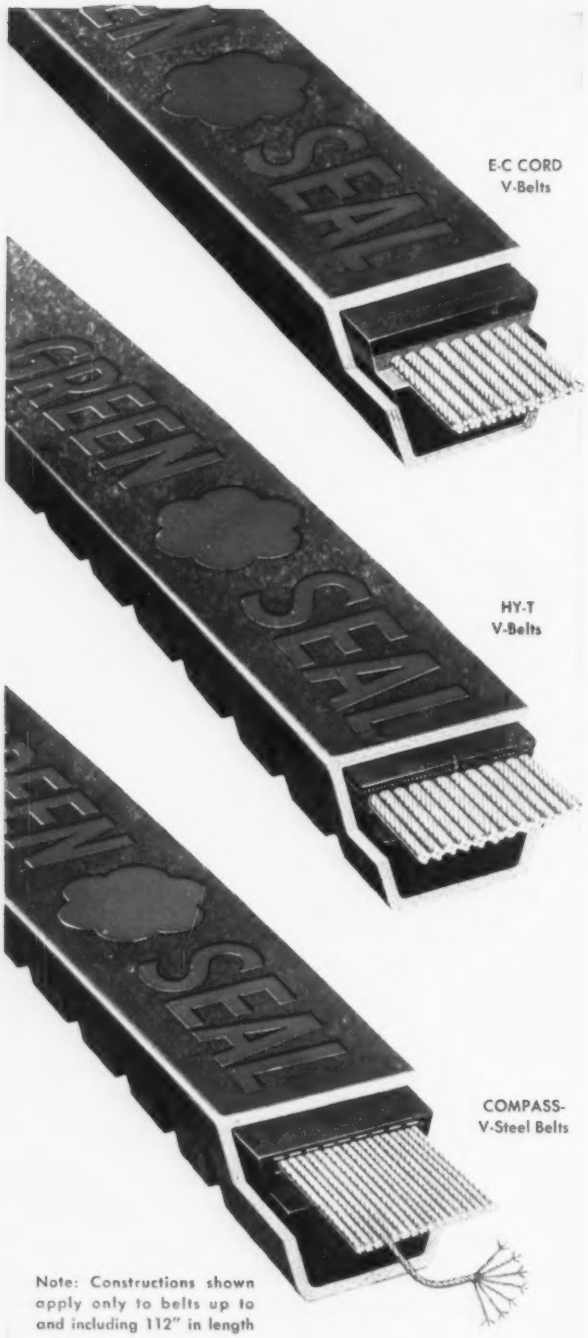
That hardworking public servant, Wilfred J. McNeil, Defense Dept. controller, has a better grasp of the situation than anyone. From what he says, we haven't done much real cutting yet; expenses are still going up; it costs money to cancel and stretch out; and more cutting is coming.

The riddle won't be answered soon. Defense cutbacks will not be as heavy as suggested by some. World tensions will govern defense spending of the basic type. Manpower will get less than equipment in the future.

Just don't believe all you see, hear, and read in the months ahead. When all the smoke clears there will be no basic weakening in the sinews of our defense.

Tom Campbell

Editor-in-Chief



E-C CORD V-Belts

HY-T V-Belts

COMPASS-V-Steel Belts

Note: Constructions shown apply only to belts up to and including 112" in length

Why V-Belts with the Green Seal ?

The Green Seal is put on each Goodyear multiple V-Belt for *your* protection. For it's your sign of a belt with dimensional stability—something long sought but only recently achieved in a complete line of V-belts.

What does dimensional stability mean to you? It means belt length remains the same from factory to drive. The length you order is the length you get. Matched sets stay matched. And mismatching – the biggest problem in belting multiple drives – is now a thing of the past.

How was this dimensional stability achieved? Until recently, stable belt length was possible only with steel cable load carriers as developed by Goodyear. But now it is also accomplished with synthetic cord through the exclusive Triple-Tempered 3-T process that stabilizes length by careful tempering with Tension, Temperature and Time.

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LETTERS FROM READERS

A Weighty Matter

Sir—I am calling your attention to an article which appeared in your July 4 issue, p. 90, "It Pays To Keep Weighing Scales Accurate." This article states, "The answer was found in a system designed by Baldwin-Lima-Hamilton Corp."

If you will refer to the photograph it is easily recognized that the instrument is a Streeter-Amet recorder, and I submit for your information that this entire system was designed, manufactured, sold and installed to and at Bethlehem Steel Corp. by the Streeter-Amet Co.—V. C. Kennedy, Pres., Streeter-Amet Co., Grayslake, Ill.

▪ Sorry, the manuscript prepared at our request, did not mention Streeter-Amet. But we're glad to hereby set the record straight.—Ed.

Carbide $?

Sir—The July 26 article, "Machining—Ferrous Metals," in the "How to Get More for Your Metalworking Dollar" series furnishes valuable information useful in tooling new jobs.

It must be also kept in mind that in high production shops today the use of more and more cemented carbides is becoming a "must." Why not also give some thought to a story covering this phase of machining? It would create much interest.—F. W. Lucht, Engr., Ruscot Tool & Engineering Co., Ferndale, Mich.

Success In Business

Sir—Would you be kind enough to send me six copies of the article, "Success in Business Takes More Than Urge to Get Ahead."

I had missed this article as our subscription started with the following week's copy but I have heard quite a lot about it and your courtesy in this matter would be very greatly appreciated. — D. C. Tayber, Pres., Martay and Co., Inc., Corona, Long Island, N. Y.

▪ Copies are on the day.—Ed.

Good Job

Sir—I would appreciate receiving six reprints of the Metalworking Dollar article in the Sept. 5 issue on "Copper and Brass." I think your editors have done an excellent job in getting this valuable information into the form you have printed it.—T. I. S. Boak, Pres., The Plume & Atwood Mfg. Co., Thomaston, Conn.

Direct Reduction

Sir—From the American Society for Metals we learned that in your magazine various articles were published on the direct reduction process for iron ore.

You would greatly oblige us in sending copies or tearsheets concerning the subject in question.—W. Aal, R. S. Stokvis & Zonen N. V., Rotterdam, Netherlands.

▪ We're mailing copies of our articles on H-Iron and "Cyclosteel" free of charge.—Ed.

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To provide deep drawing thinstrip brass with increased tensile strength and elongation Somers installed the first high speed continuous annealer in the non-ferrous industry. This produces a much finer grain size than batch annealing with the result that only a single color buff is needed for a polished finish: heavy buffing and orange peel effect are eliminated, an additional saving in production time.
Whatever your problems in thinstrip brass, nickel, copper and alloys, Somers will be glad to solve them for you without cost or obligation.
Write for Confidential Data Blank.

Somers THIN STRIP

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102 BALDWIN AVE. WATERBURY, CONN

NEW

THE ACCURATE A. D. M.© STEEL RULE MALE and FEMALE DIE

MALE & FEMALE DIES

FOR METAL STAMPING

- Steel and Similar Metals up to .140 in Thickness
- Aluminum and Similar Metals up to .202 in Thickness

COST

Only a fraction of the cost of conventional Male & Female Dies. The larger the die the greater the proportionate savings.

Come complete with line-up pins ready to attach to your die set.

DELIVERY FROM 2 TO 5 DAYS

BREAK YOUR DIE BOTTLE NECK
SOLVE YOUR DIE MAKER SHORTAGE

An Accurate ADM "Steel Rule" Male & Female Die Is Your Best Buy

ALL QUOTATIONS ANSWERED THE SAME DAY WE RECEIVE THEM

MINIMUM PRODUCTION ON STEEL AND SIMILAR METALS

THICKNESS	MINIMUM	MAXIMUM
1/32 STEEL	100,000	UNKNOWN
1/16 STEEL	100,000	UNKNOWN
3/32 STEEL	75,000	UNKNOWN
1/8 STEEL	50,000	UNKNOWN

MAXIMUM UNKNOWN AS DIES HAVE NEVER BEEN RUN TO DESTRUCTION

MINIMUM PRODUCTION ON ALUMINUM AND SIMILAR METALS

THICKNESS	MINIMUM	MAXIMUM
1/16 ALUMINUM	125,000	UNKNOWN
3/32 ALUMINUM	100,000	UNKNOWN
1/8 ALUMINUM	75,000	UNKNOWN
5/32 ALUMINUM	50,000	UNKNOWN
3/16 ALUMINUM	40,000	UNKNOWN

MAXIMUM UNKNOWN AS DIES HAVE NEVER BEEN RUN TO DESTRUCTION

The Best Buy is an Accurate Die

ACCURATE©

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OVER A QUARTER OF A CENTURY OF DIE MAKING SERVICE TO INDUSTRY

FATIGUE CRACKS

Small-Plant Angle

The distinguished gentleman on this week's cover is Bruce Willsey, who brings us some cogent thoughts on small-plant automation. As manager of Solar Aircraft Company's Des Moines plant, he's had an opportunity to observe the needs and problems firsthand—the effects, too, on both management and labor.

He holds that small firms can profit by automation, as long as they approach it strictly in terms of small-plant economics. And while some of the techniques he describes may not meet the purist's definition of automation, they accomplish the same ends — faster output and lower costs. The article starts on p. 115.

Hush Money

This country is presently fighting what Scotty Reston of the New York Times called "a war of unvouchered funds." Where do these funds come from and how are they accounted for? This has always puzzled us.

Well, we have a man who wades through a great mass of Atomic Energy Commission material to bring you, dear reader, what we think you'd like to have on this subject.

Off the Record—Just before he fell asleep the other night whilst perusing a transcript of the hearings on the AEC's 1958 budget he had reached p. 189 when he came to the headline "Confidential Funds."

AEC Chairman Strauss was on the witness stand. Committee Chairman Cannon, explaining that AEC had been authorized to spend $100,000 in unvouchered confidential funds in fiscal '57, asked Admiral Strauss how much had actually been spent. Not the purpose of the expenditures, mind you! That would remain confidential—certainly not for the record!

This permits us to disclose to you the actual unvouchered amount spent in fiscal '57: It was $24.

Big John

Here's a new twist in employee relations. Sounds good, too. New machines in the plant of Milwaukee's Fulton Co. are being named after the firm's long-time employees.

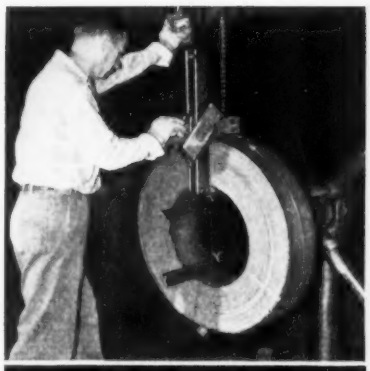
It all started when B. R. Weber, manufacturing and engineering vice president of the automotive and marine parts company, visited one

Morale builder in action.

of the employees who was in the hospital.

Morale Builder—To cheer him up, Weber told him a new press was to be called "Little Buck" in his honor. The effect on his morale both at the hospital and upon his return to work was so good that the company decided to extend the practice.

Latest employee to be so honored is John J. Konkol. The "Big John" press shown here is a new 250-ton capacity Minster press which stands 15.5 ft high. It has a total weight of 80,000 lb, a ram weight of 6,000 lb and is used to form trailer couplings and marine winches.



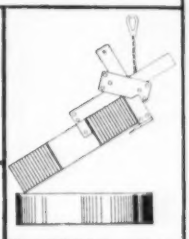
DIXON
One-Man COIL GRAB

Cuts Time and Costs With One-Motion Reel Loading

The Dixon Coil Grab saves labor and speeds coil handling by enabling one man to lift, turn and load coil on the stock reel with a single, easy motion. Forged steel wedge speeds separation of stacked coils. Positive grip and support eliminate coil damage, assure operator safety. Standard models available from stock. Capacities from 1,000 to 5,000 and 10,000 to 15,000 lbs., for coil widths ¼" to 48".

ALL MODELS AVAILABLE FROM STOCK

MODEL A COIL GRAB
Wedge separates coils easily. Lifts and turns in one motion.



MODEL H COIL HOOK
Pivoting shoe supports, turns, and locks coil in position in one motion.

WRITE FOR COMPLETE DATA
New bulletins illustrate standard models and show how to handle all coil sizes safely, rapidly, without damage. Write for them today.

DIXON AUTOMATIC TOOL, Inc.
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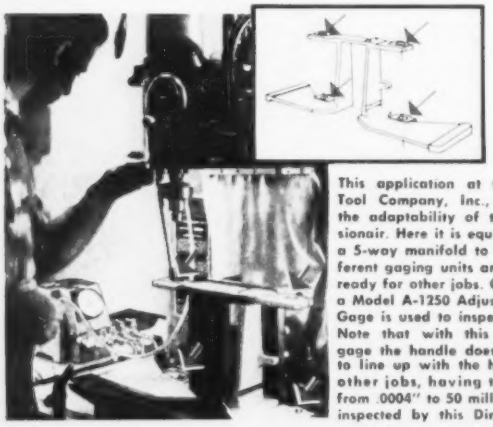
ROCKFORD, ILLINOIS
Equipment for Automatic Parts Handling and Assembly

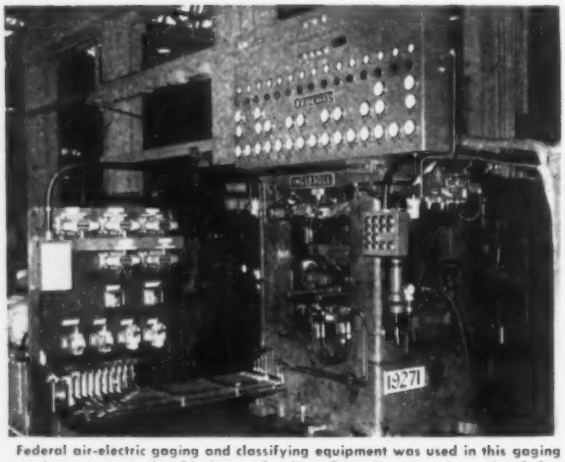
THEY GAGE THESE JOBS BETTER with the DIMENSIONAIR

The increased complexity of more and more of today's gaging requirements calls for the utmost in dependable accuracy. So many times the accuracy of one dimension is dependent upon the accuracy of another. Automation, too, brings in another set of complications where misbehavior of the gaging process can upset your whole schedule

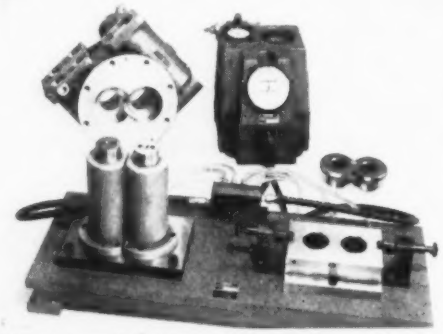
The dependable no-drift accuracy of the Dimensionair is of the utmost advantage in such cases. Its reliability keeps quality up and keeps production rolling. Even on the simpler jobs the dependable no-drift accuracy and the foolproof operation of the Dimensionair are definitely appreciated. Call on us if you want to do a better gaging job. See our address below.



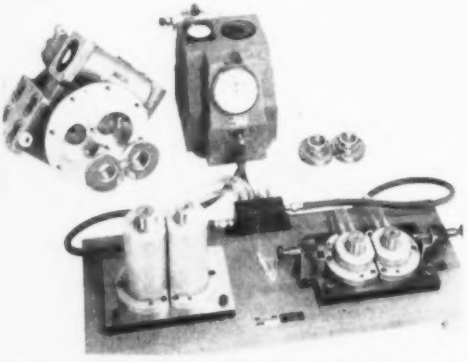
This application at the Arrow Tool Company, Inc., illustrates the adaptability of the Dimensionair. Here it is equipped with a 5-way manifold to which different gaging units are attached ready for other jobs. On this job a Model A-1250 Adjustable Bore Gage is used to inspect 4 holes. Note that with this particular gage the handle does not have to line up with the hole. Many other jobs, having tolerances from .0004" to 50 millionths, are inspected by this Dimensionair.



Federal air-electric gaging and classifying equipment was used in this gaging station on an engine block transfer line. Two diameters in each of five crankshaft bores and two each in five camshaft bores are measured — twenty holes in all. After automatic assembly, oil holes in the five bearing liners are checked for alignment with the holes in the camshaft bores. All conditions are checked simultaneously. Signal lights indicate all dimensional conditions. Unsatisfactory blocks are automatically rejected. Cycle time is well within production cycle time. Ingersoll Milling Machine Company supplied the handling and positioning units.



Two differential type Dimensionairs are used on this precision assembly. The first step in shown above. Parallel bores in a gear housing are located on the twin gaging plugs and the bushings that are to be pressed into these bores are placed in the twin ring gage at the right. The Dimensionair shows whether the flange flats on the bushings will have the proper clearance when bushings are assembled in the housing.



A second gage is used for the next step. After the bushings are inserted in the housing, they are located on the left hand pair of gage plugs. Then, a different set of bushings for the cover plate is placed on the right hand plugs. The single dial on this gage shows whether the center distances in the two pairs of bushings are the same within a tolerance of ± .0005". If the first two cover plate bushings measured do not meet this standard, others can be tried until a pair is found that does. Proper alignment of these bearing surfaces is assured at final assembly.

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FOR RECOMMENDATIONS IN MODERN GAGES . . .

Dial Indicating, Air, Electric, or Electronic — for Inspecting, Measuring, Sorting, or Automation Gaging

EXHIBITS, MEETINGS

Packaging & Handling Show—Oct. 28-31, Atlantic City. (SIPMHE, One Gateway Center, Pittsburgh 22.)

AtomFair '57—Oct. 28-31, New York. (Atomic Industrial Forum, 3 E. 54th St., N. Y. 22.)

Metal Show—Nov. 2-8, Chicago. (American Society for Metals, 7301 Euclid Ave., Cleveland 3.)

SEPTEMBER

National Screw Machine Products Assn.—Fall membership meeting, Sept. 29-Oct. 3, Broadmoor Hotel, Colorado Springs, Colo. Society headquarters, 2860 E. 130th St., Cleveland 20.

OCTOBER

The Electrochemical Society — Semi-annual meeting, Oct. 6-10, Statler Hotel, Buffalo. Society headquarters, 216 W. 102nd St., New York.

American Institute of Steel Construction — 35th annual meeting, Oct. 6-11, Hotel del Coronado, Calif. Society headquarters, 101 Park Ave., New York.

American Society of Lubrication Engineers—Fourth conference, Oct. 7-9, Royal York Hotel, Toronto, Ont., Canada. Society headquarters, 84 E. Randolph St., Chicago.

Electric Overhead Crane Institute —Fall meeting, Oct. 10, Hillbrook Country Club, Cleveland. Society headquarters, One Thomas Circle, Washington 5, D. C.

Society for Experimental Stress Analysis — Annual meeting, Oct. 9-11, Hotel El Cortez, San Diego, Calif. Society headquarters, P. O. Box 168, Cambridge 39, Mass.

Committee on Vacuum Techniques —Fourth annual symposium on high vacuum technology, Oct. 9-11,

(Continued on P. 16)

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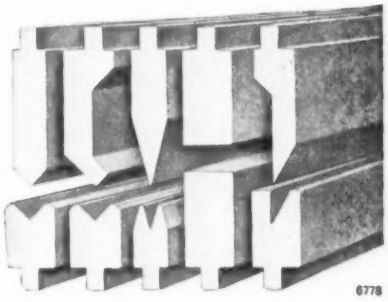
This country-wide organization of local dealers offers immediate delivery on many CHICAGO *induction hardened* press brake dies. These stock dies are economical, and the quick delivery saves time in tooling. They are available in any length from 4 to 12 feet in increments of 2 feet.

Stock dies are used for a surprisingly large variety of bending operations. And, with CHICAGO *induction hardened* dies you get bonus performance and increased die life at no extra cost. Remember, these dies can be used in any make or size of standard press brake.

On your needs for press brake dies, call your nearest dealer listed here. With Bulletin D-455 you can order by number. Ask for copy.



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*Induction hardening is a special, high-frequency process used to harden the wear surfaces of CHICAGO dies. Field reports on CHICAGO *induction hardened* dies show up to ten times longer life than conventional press brake dies.

CHICAGO DREIS & KRUMP

Press Brakes • Straight-Side-Type Presses • Press Brake Dies
Hand and Power Bending Brakes • Special Metal-Forming Machines

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Eastern supplies more tonnage of more types of stainless steel sheets and plates for aircraft, missiles and rockets than any other exclusive producer in the world.

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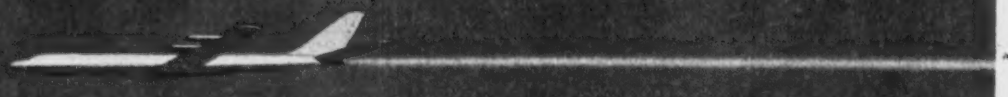

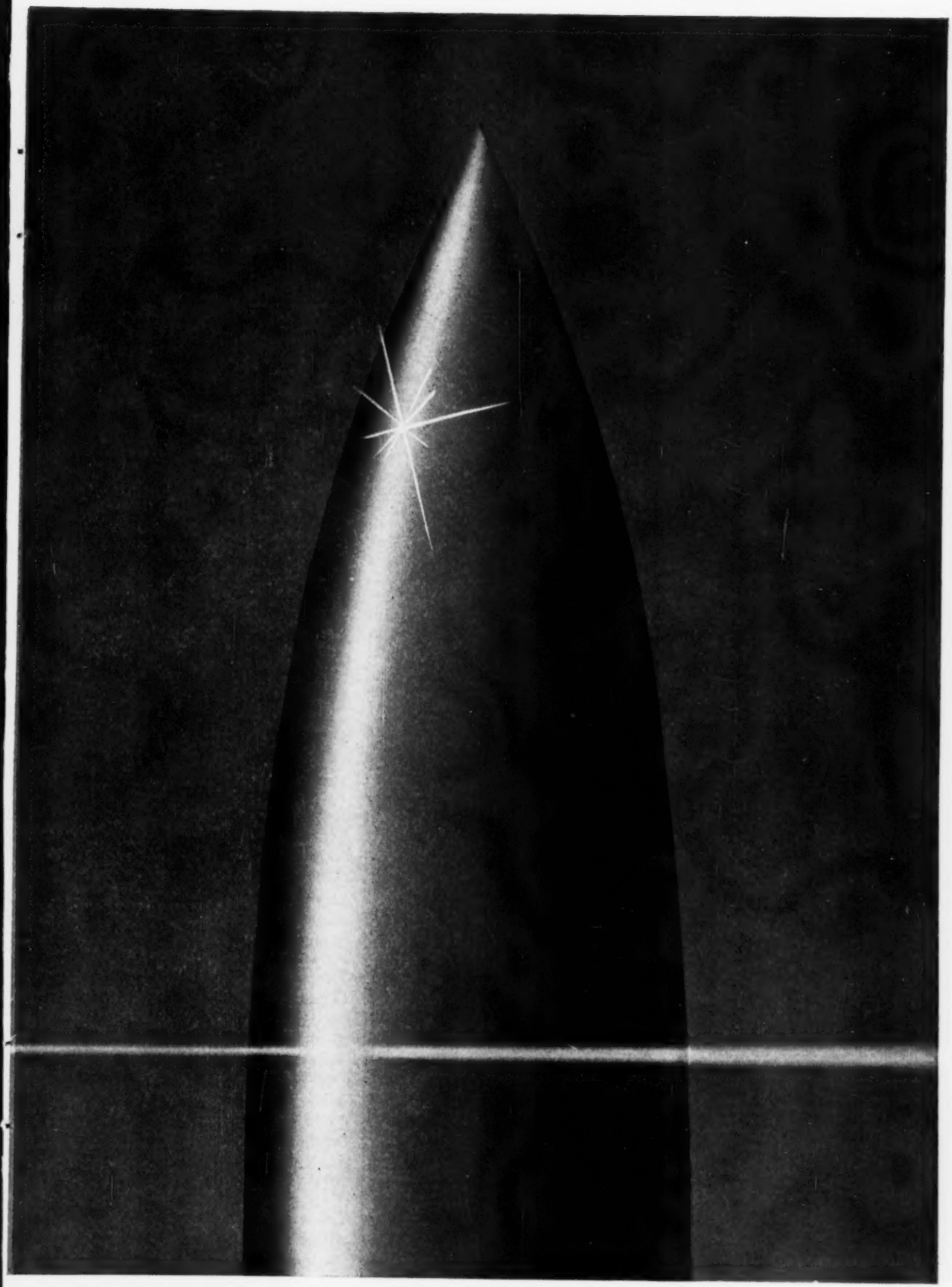

Binks Complete Line offers you
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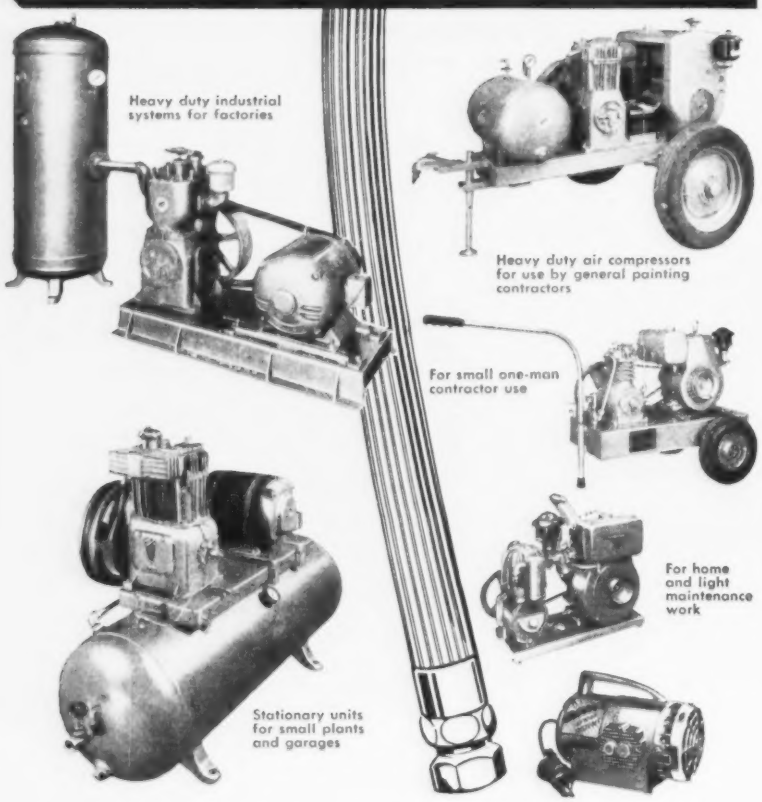
AIR COMPRESSOR
to meet your special needs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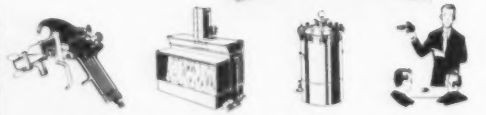
Heavy duty air compressors for use by general painting contractors
For small one-man contractor use
For home and light maintenance work
Stationary units for small plants and garages

For each job there is an air compressor that is just right...one that gives you the volume and pressures you need with maximum flexibility and economy. The Binks Line of air compressors gives you a choice of 50 models from compact ¼ h.p. portable units to almost any size you need...each designed to do a specific job or to fit into a given air supply system. Before you buy or specify a new compressor, investigate the Binks Line...it will pay you!

To be sure you get the right compressor

Ask your distributor or write direct to us for copies of **HOW TO SELECT AN AIR COMPRESSOR** and **BINKS CATALOG 820.** They will tell you what to look for in an air compressor and show you available models, accessories, etc. No obligation.

Binks
EVERYTHING FOR SPRAY PAINTING



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EXHIBITS, MEETINGS

(Continued from P. 13)

Hotel Somerset, Boston. Society headquarters, Box 1282, Boston.

Gray Iron Founders' Society, Inc. —Annual meeting, Oct. 9-11, The Drake Hotel, Chicago. Society headquarters, 930 National City-E 6th Bldg., Cleveland.

Conveyor Equipment Manufacturers Assn. — Annual meeting, Oct. 12-15, The Grand Hotel, Point Clear, Ala. Society headquarters, One Thomas Circle, Washington, D. C.

Pressed Metal Institute — Annual meeting, Oct. 13-17, Castle Harbour, Bermuda. Society headquarters, 3673 Lee Rd., Cleveland.

Rail Steel Bar Assn.—Fall meeting, Oct. 14-16, Western Hills Hotel, Fort Worth, Tex. Society headquarters, 38 S. Dearborn St., Chicago.

Wire Assn. — Annual convention, Oct. 14-17, La Salle Hotel, Chicago. Society headquarters, 453 Main St., Stamford, Conn.

American Society of Civil Engineers —Annual meeting, Oct. 14-18, Hotel Statler, New York. Society headquarters, 33 W. 39th St., New York.

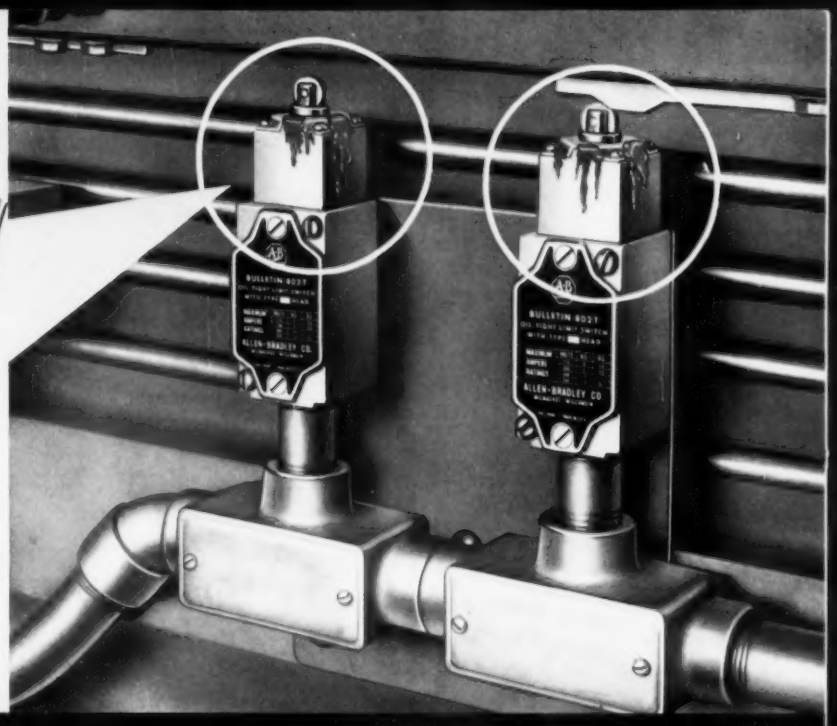
Society of Plastics Engineers, Inc.— Regional technical conference on polyethylenes—properties and uses, Oct. 17, Hotel Carter, Cleveland. Society headquarters, 34 E. Putnam Ave., Suite 116-118, Greenwich, Conn.

The Magnesium Assn. — Annual Convention, Oct. 17-18, The Biltmore, New York. Society headquarters, 122 E. 42nd St., New York.

Foundry Equipment Manufacturers Assn., Inc.—Annual meeting, Oct. 17-19, The Greenbrier Hotel, White Sulphur Springs, W. Va. Society headquarters, One Thomas Circle, Washington 5, D. C.

American Nuclear Society—Second winter meeting, Oct. 28-31, Henry Hudson Hotel, New York.

Completely Oil-Sealed!



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802TC Side Push Rod Type

802TF Rod Type

802TA Roller Lever Type

802TB Top Push Rod Type with Plastic Window

802TAO Roller Lever Type for Cavity Mounting

802TG Adjustable Roller Lever Type

SEALED HEAD KEEPS OUT OIL, COOLANT, METAL CHIPS ...your guarantee of reliable limit switch operation!

With *completely sealed* operating heads, as well as sealed switch bodies, Allen-Bradley Bulletin 802T oiltight limit switches provide maximum reliability in limit switch operation for your modern, high speed production machines. The sealed head excludes oil, dirt, and metal chips from the operating mechanism ... the spring return, momentary contact operators cannot become sluggish and stick.

The maintenance free, double break, silver alloy contacts are sealed in the oiltight body. Interchangeable operating heads are available with various push rods and levers which can be mounted in any one of four positions. Oiltight transparent plastic covers, for inspecting contacts and wiring without removing the cover, are available for most units.

Here's a line of *quality* limit switches in which each type will provide millions of trouble free operations. Have your A-B control engineer acquaint you with this latest development—another advance in limit switch design.

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Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.
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9-57-MR

NOW... ALLEN-BRADLEY PRECISION-TYPE LIMIT SWITCHES ARE ALSO OILTIGHT!

OILTIGHT HEAD — Newly designed head on push type seals out oil. Roller lever types have sealed operating shafts.

OILTIGHT BODY — Synthetic rubber gasket between housing and plate excludes oil and coolant from operating mechanism.

Allen-Bradley precision-type limit switches combine very close operating tolerances with such a sturdy construction that they can be used for any industrial application. Now this line of limit switches has been further improved by making them completely oiltight.

Especially designed for use where the motion to operate the limit switch is measured in thousandths of an inch. these Allen-Bradley limit switches can henceforth be employed in applications where oils, coolants, and dust are present.

Allen-Bradley Bulletin 802 oiltight precision limit switches have a positive snap action mechanism which prevents any possibility of a "dead center" . . . no matter how slowly the actuating force is applied. They are available in both the spring return and maintained contact construction. And all have maintenance free, double break, silver alloy contacts.

Specify these Allen-Bradley oiltight limit switches where "precision" operation is required and where dirt and oil could cause trouble.

Push rod type. Plastic cover, for inspection without removing cover, made for most units.

Roller lever type limit switch with lever on right side. Also available with lever on left side.

Roller lever precision-type limit switch with roller lever in front of the switch body.

ALSO—GENERAL PURPOSE LIMIT SWITCHES

Bulletin 801 general purpose limit switches in standard or heavy duty ratings. Maintained or momentary contacts with slow or snap action. Silver alloy contacts used throughout this line.

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MOTOR CONTROL
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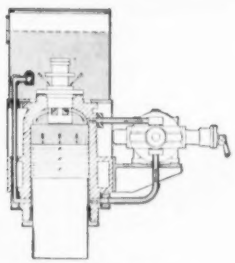
A-B QUALITY

9-57-MR

In Canada: Allen-Bradley Canada Ltd., Galt, Ont.

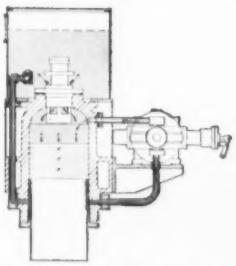
9-57-MR

HERE'S WHY H-P-Ms PAY OFF



Fastraverse Ram Advance

is controlled by rate pump; withdraws oil from supporting area. FASTRAVERSE prefill system augments oil to main cylinder from overhead reservoir during advance stroke.



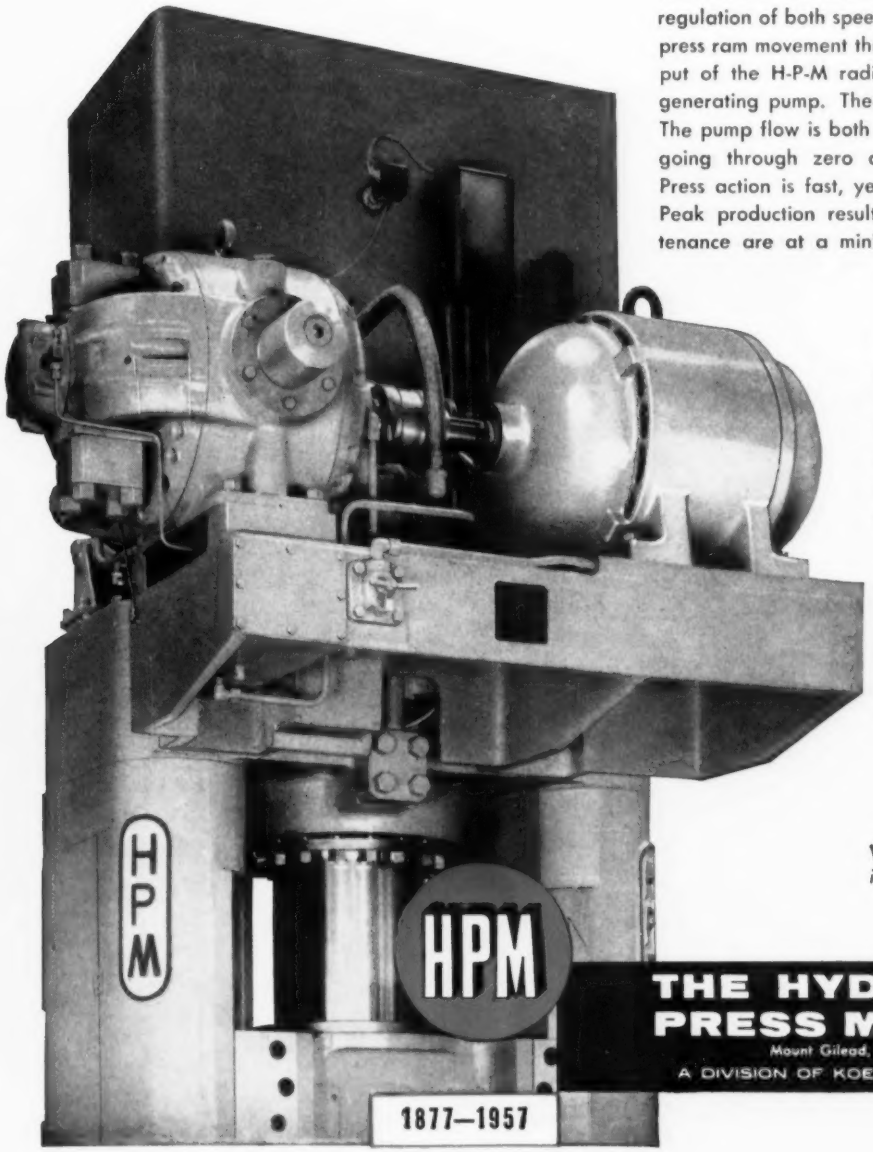
Fastraverse Ram Return

At reversal, pump delivers oil to supporting area by reversing direction of oil flow through pump. At this time, FASTRAVERSE prefill system opens and allows excess oil not handled by pump to be discharged back to tank.

FASTRAVERSE CLOSED CIRCUIT PRESS SYSTEM

Automatic Speed and Cycle Control

The H-P-M "Closed Circuit" system provides regulation of both speed and direction of every press ram movement through control of the output of the H-P-M radial piston type pressure generating pump. There is no reversing valve. The pump flow is both variable and reversible, going through zero at each press reversal. Press action is fast, yet smooth and shockless. Peak production results; idle time and maintenance are at a minimum.



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Write for complete information Bulletin 5500

THE HYDRAULIC PRESS MFG. CO.
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A DIVISION OF KOEHRING COMPANY

What we <u>really</u> deliver to Steel Buyers is

ADDED PRODUCTION EFFICIENCY

Added production efficiency . . . that's what you're *really* getting when you order from your nearby Steel Service Center.

You're buying MORE than steel . . . shaped or cut as you want it. You're buying *production continuity* . . . the ability to keep jobs moving on schedule. Prompt deliveries from local warehouse stocks make this possible.

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Measure the cost of your purchases from Steel Service Centers in these terms. Weigh them against the much higher costs you'd face if their diversified steel stocks and efficient cutting and handling services were *unavailable* to you!

Call in the representative of your Steel Service Center—a vital segment of America's steel distribution system. Get his practical suggestions on how you can make the *most productive use* of his diversified stocks, modern facilities and services. American Steel Warehouse Association, Inc., 540 Terminal Tower, Cleveland 13, O.

A Coast-to-Coast Network of Steel Service Centers serves North American industry . . . by maintaining diversified steel stocks and modern cutting equipment. Each is specifically set up to meet the needs of its immediate area.

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YOUR STEEL SERVICE CENTER

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The most silent rolling contact bearing in the world of today

EVERY TYPE—EVERY USE

SKF®

- *Ball Bearings*
- *Cylindrical Roller Bearings*
- *Spherical Roller Bearings*
- *Tapered Roller Bearings* ("Tyson")

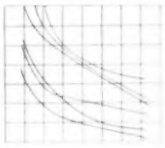
*Reg. U.S. Pat. Off. Tyson Bearing Corporation

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.

7761

What every good metal man should know about CARBONITRIDING

First of all, it is a good idea to know what equipment will do the best carbonitriding job for your specific requirement. And the best way to find this out is to talk over your problems with the people who have consistently developed the methods and equipment for better, more dependable, more economical carbonitriding results. That would be Lindberg.



Let's look at the record. Lindberg's contributions to carbonitriding and carburizing go far beyond just the building of furnaces to do it. It covers the development of controlled atmosphere generators, the creation of dew point equilibrium curves to establish proper atmosphere values for type of steel and temperatures involved and the exclusive Lindberg Carbotrol to maintain these values automatically in production.

Typical installation of Lindberg Hyen Atmosphere Generator, Lindberg Carbotrol and Lindberg Carbonitriding Furnace.

Then there is the invention of the "dimple" vertical radiant tube which gave new efficiency and economy to fuel-fired atmosphere furnaces. Lindberg's exclusive CORRTHERM electric heating element made practical the use of electricity in atmosphere furnaces.

Add to this our record over the years of building a broad variety of carbonitriding and carburizing furnaces, big ones, small ones, manuals, automatics, fuel-fired, electric, and it seems it's just good common sense to bring your heat treating problems to us. Just get in touch with the Lindberg Field Representative in your locality or write:

LINDBERG ENGINEERING COMPANY

2450 West Hubbard St., Chicago 12, Illinois

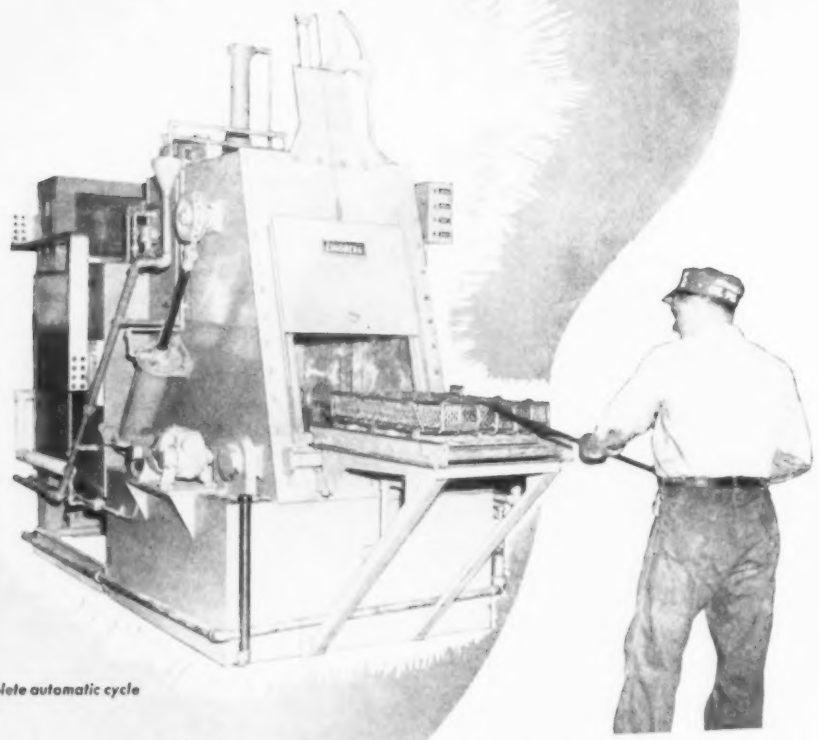
Los Angeles Plant: 11937 S. Regentview Ave., at Downey, California.

LINDBERG

heat for industry

Here's the work-horse

for many a carbonitriding job



This furnace has ***complete automatic cycle*** *and quench control.*

This is the most widely-used carbonitriding furnace of all. Day in and **day out production** of tons and tons of work has proved this furnace's **ability to increase** production quality and volume and reduce costs. **It is a versatile** furnace, too, not only for carbonitriding but for other uses, carburizing, annealing, carbon restoration and many hardening applications.

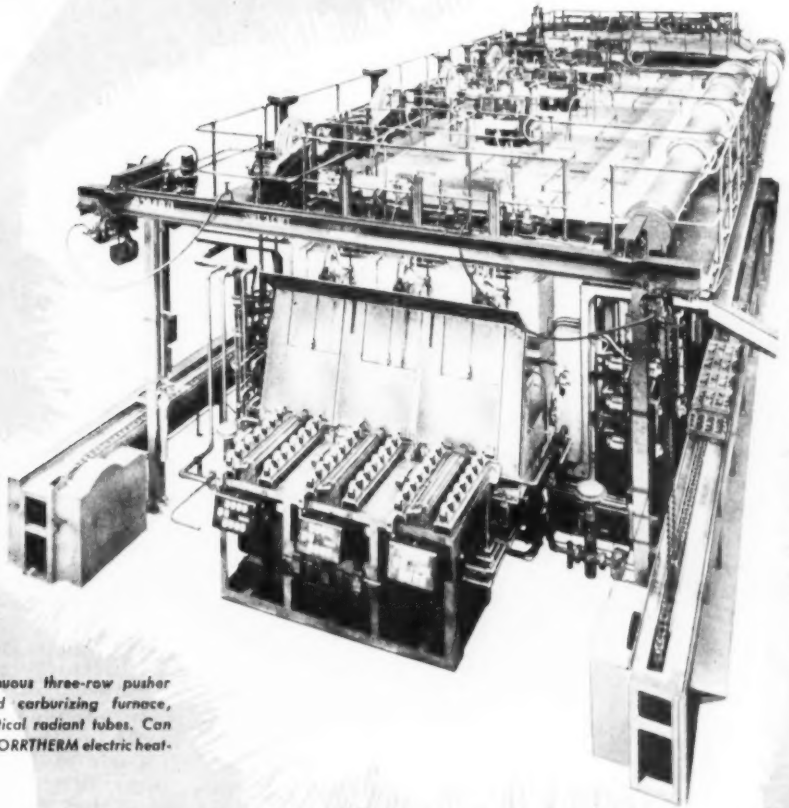
This type of furnace is available for both manual and automatic operation. It can be equipped either with Lindberg's efficient new vertical radiant tubes for fuel-firing or for electric heating with Lindberg's revolutionary new CORRTHERM element.

Versatile as this furnace is, we don't claim it is the best solution to *every* carbonitriding problem. But, whatever your need may be, talk it over with Lindberg. Our engineers, as they have done in so many instances, will recommend a sound answer—design it, build it, even field-install it if you wish. Just get in touch with the Lindberg plant or the Lindberg Field Representative in your locality. Lindberg Engineering Company, 2450 West Hubbard St., Chicago 12, Illinois. Los Angeles Plant: 11937 S. Regentview Ave., at Downey, California.

LINDBERG

heat for industry

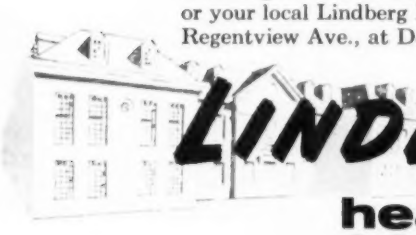
We put the Big Heat on with this one!



A Lindberg continuous three-row pusher carbonitriding and carburizing furnace, gas-fired with vertical radiant tubes. Can also be built with CORRTHERM electric heating elements.

If your carbonitriding or carburizing problem is a big one, better talk it over with Lindberg. The broad experience of our engineering staff in the development of methods and equipment for every heat treating function offers a pretty sure promise of the most practical answer to it. Particularly where field installation is advisable our combination of engineering know-how and sound installation experience is especially valuable to you.

Whether your requirement will call for the installation of a big baby like the one shown above or a complete heat treating department of smaller units, Lindberg will handle the job all the way. We specialize in "turn-key" installations, covering everything from design and engineering to the finished ready-to-go-to-work job complete with all the construction needed to fit the heat treating equipment into your production processes. Pass your problem to Lindberg. Get in touch with Lindberg Industrial Corporation, 2321 West Hubbard Street, Chicago 12, Illinois, or your local Lindberg Field Representative. Los Angeles Plant: 11937 S. Regentview Ave., at Downey, California.



LINDBERG

heat for industry

NEW: ***Man-made Giraffe***

Unique Aerial Platform Moves On Cylinders Made From Pittsburgh Tubes

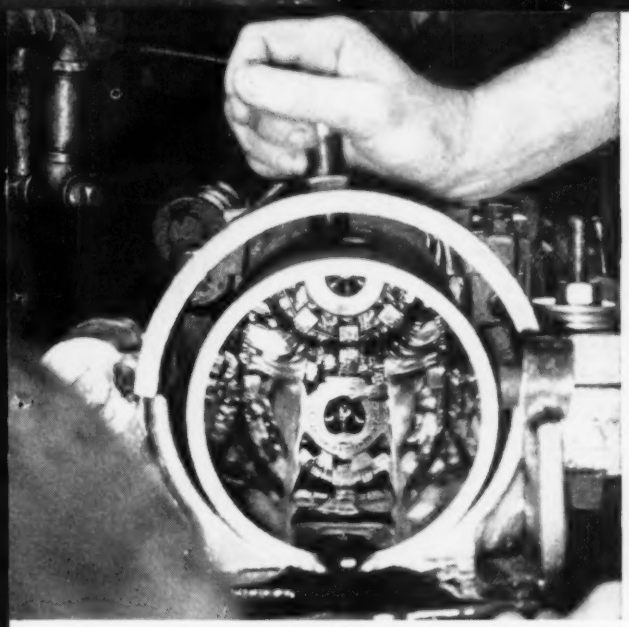
Giraffes are big business at Pitman Manufacturing Company.

Not the giraffes of the animal kingdom but ingenious hydraulic aerial platforms. These mechanical "Giraffes" are used for anything from de-icing a giant Air Force bomber to fighting fires in tall buildings.

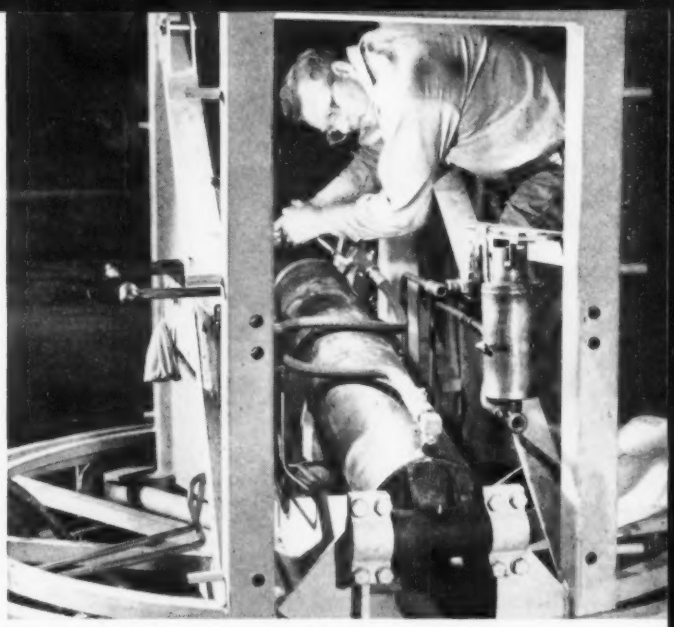
Pitman's truck-mounted Giraffes depend on hydraulic cylinders made exclusively of Pittsburgh Steel Company's seamless mechanical tubes. Giraffes are finding wide acceptance in varied industries because:

- Workmen can reach heights up to 65 feet in a fraction of the time and cost required by other methods. And their tools go up right with them.
- The roomy, insulated platform carries two men who can control all platform movements with controls duplicating those on the ground.
- The aerial platform can rotate a full 360 degrees in either direction in a radius as great as 35 feet.
- The largest of three models permits the 31-foot upper boom to move in a 160-degree vertical arc. The 23-foot lower boom can move in an 80-degree arc, so workmen can reach the exact spot they want.
- Hydraulic outriggers, operated independently, are raised or lowered by moving hand levers at side of truck.

Since hydraulic cylinders are vital to safe, dependable, economic operation of the Giraffe, Pitman makes its own cylinders with great care.



Horizontal honing of Pittsburgh Steel tubes is an exacting process. Inside the tube, you can see part of the hones. At the end of the tube, the hones are mirrored on polished steel.



Finished cylinder is installed on turntable of Pitman Giraffe. This cylinder supports and moves the lower boom. Completed Giraffe will be mounted on truck supplied by customer.

All Giraffe hydraulic cylinders are made from tubing produced by the Tube Mills of Pittsburgh Steel Company and sold by the Kansas City distributor, Metal Goods Corporation.

"We get high production from tubes because Pittsburgh tubes hold to close tolerances," declared Arthur Moore, vice president and general manager of Pitman Manufacturing. He added:

"We give Pittsburgh Steel tubes credit for cutting our scrap losses. But economy isn't all we're thinking of. Since we never forget that men's lives depend on our cylinders we build a safety factor of at least three into every cylinder. We've never had a burst cylinder or a cylinder wall failure with Pittsburgh tubes.

"Finally, Pittsburgh Steel gives us the kind of service we like."

Mr. Moore said engineers from Pittsburgh Steel helped analyze the company's tube problems, suggested some design changes and took Pitman's prints back to the mill to make tubing which exactly fills the bill.

"The service which Pittsburgh Steel instituted ended our tubing problems," said Mr. Moore. "Our cylinders have been very satisfactory ever since."

Whether you make hydraulic cylinders or use seamless mechanical tubing in another application needing uniformity, close tolerances and engineering help, you can profit by Pitman's experience.

Start today by getting in touch with trained help available through any Pittsburgh Steel Company District Office or from one of the Pittsburgh Steel distributors listed at right.

Fire-fighting is just one of many uses for the Pitman Giraffe. These firefighters can move their platform to any given spot quickly and easily without losing time when time counts most.

Pittsburgh Seamless Distributors

Baker Steel & Tube Company
Los Angeles, California

Chicago Tube & Iron Company
Chicago, Illinois

Cleveland Tool & Supply Co.
Cleveland, Ohio

Drummond McCall & Co., Ltd.
Montreal, Quebec, Canada

Edgcomb Steel Company
Philadelphia, Pennsylvania

Gilmore Steel & Supply Co.
San Francisco, California

Earle M. Jorgensen Co.

Perry Kilsby, Inc.
Los Angeles, California

Mapes & Sprowl Steel Co.
Union, New Jersey

Metal Goods Corporation
St. Louis, Missouri

Miller Steel Company, Inc.
Hillside, New Jersey

A. B. Murray Co., Inc.
Elizabeth, New Jersey

Ryerson, Joseph T. & Son, Inc.
Chicago, Illinois

Solar Steel Corporation
Cleveland, Ohio

Steel Sales Corporation
Chicago, Illinois

Tubular Sales
Detroit, Michigan

Ward Steel Service Company
Dayton, Ohio

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

District Sales Offices

Atlanta, Chicago, Cleveland, Dallas, Dayton, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Tulsa, Warren, Ohio

Here's what steel Kaiser

COMPARATIVE ENDWALL TRIAL "... had inspected walls day prior to accident and noted Kaiser Periclase Chrome Metal Encased Brick sections were plumb, in line and tight whereas competitive sections were bowed and leaking."

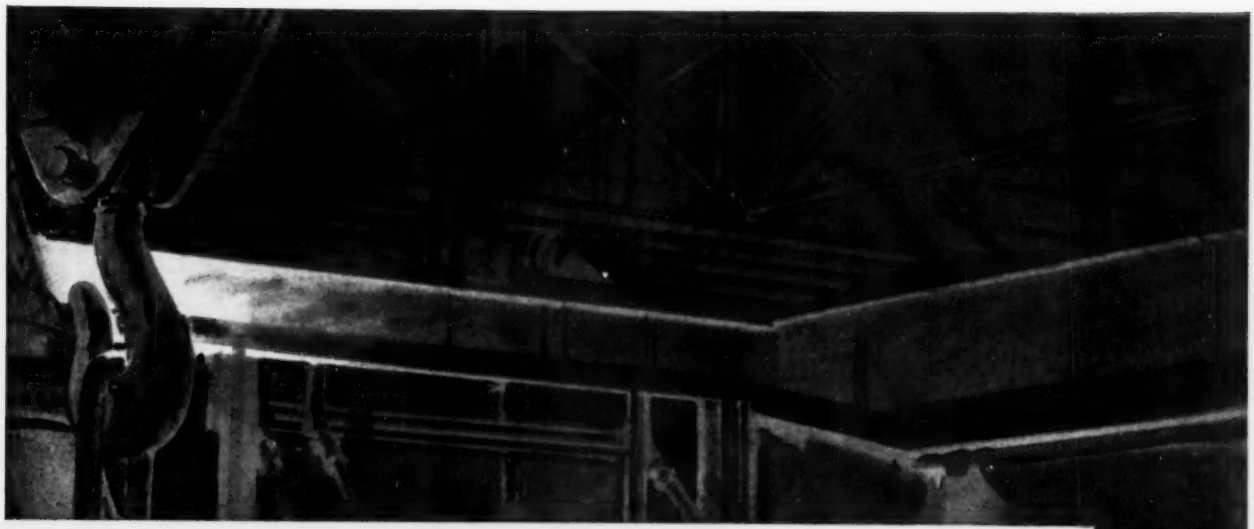
BACKWALLS "... having tremendous success with Kaiser Chrome Periclase Brick in backwalls ... on rebuild, gave instructions to leave it in for another campaign."

HOT TAP HOLES "... averaging between 20 and 25 heats with Permanente 165 on the 300-ton furnaces, where competitive mix previously gave 3 to 5 heats."

ENDWALLS "... Panels of Kaiser Periclase Chrome Metal Encased Brick went 402 heats while competitive panels in the same campaign were replaced at 265 heats."

BOTTOM PERFORMANCE "... Permanente 165 bottom has tapped 413 heats with delay figure of 3 minutes while competitive bottom - rammed five days earlier - has tapped only 360 heats with an average delay figure over bogey of 11 minutes."

ENDWALLS "... Furnace finished its third campaign using Kaiser Periclase Chrome Brick endwall for a total of 562 heats. Other furnaces using competitive brick usually lasted only 200 heats - one campaign."



industry users are saying about Basic Refractories

One of the most significant things about these statements from Kaiser Chemicals customers is that each of them illustrates a *new performance or production record* made possible by changing to a Kaiser Chemicals basic refractory product.

Why this uniform superiority?

Kaiser Chemicals refractories are *especially designed* for peak performance in specific applications in open hearth and electric steel furnaces. Each is a specially-developed composition . . . each is backed by more than 15 years of continuous research and development.

The uniform composition of Kaiser Chemicals refractories—your guarantee of dependability—is assured by Kaiser Chemicals fully-integrated facilities, controlling quality from initial production of sea water magnesia to assistance in final installation at your mill.

Call or write Kaiser Chemicals Division, Dept. S7144, Kaiser Aluminum & Chemical Sales, Inc., at any of the Regional Offices listed below:

PITTSBURGH 22, PA. . . . 3 Gateway Center
HAMMOND, IND. . . . 518 Calumet Building
OAKLAND 12, CALIF. . . . . 1924 Broadway

KAISER CHEMICALS BASIC REFRACTORIES FOR THE STEEL INDUSTRY:

Kaiser **PERICLASE** Brick (D-S)
Kaiser **PERICLASE-CHROME** Brick
Kaiser **CHROME-PERICLASE** Brick
Permanente 165 Ramming Mix
Permanente 84 Ramming Mix

Kaiser Chemicals

Pioneers in Modern Basic Refractories

REFRACTORY BRICK & RAMMING MATERIALS • CASTABLES & MORTARS
MAGNESITE • PERICLASE • DEADBURNED DOLOMITE • ALUMINAS

IMPROVE DESIGN . . . get assistance

from Ferry Cap—fastener experts for 50 years

Often we can suggest a fastener of special shape that will reduce your over-all product costs. Sometimes these special screws eliminate parts, replace more expensive parts, or reduce assembly time. Frequently they improve product performance. In all cases, Ferry Cap customers get the benefit.

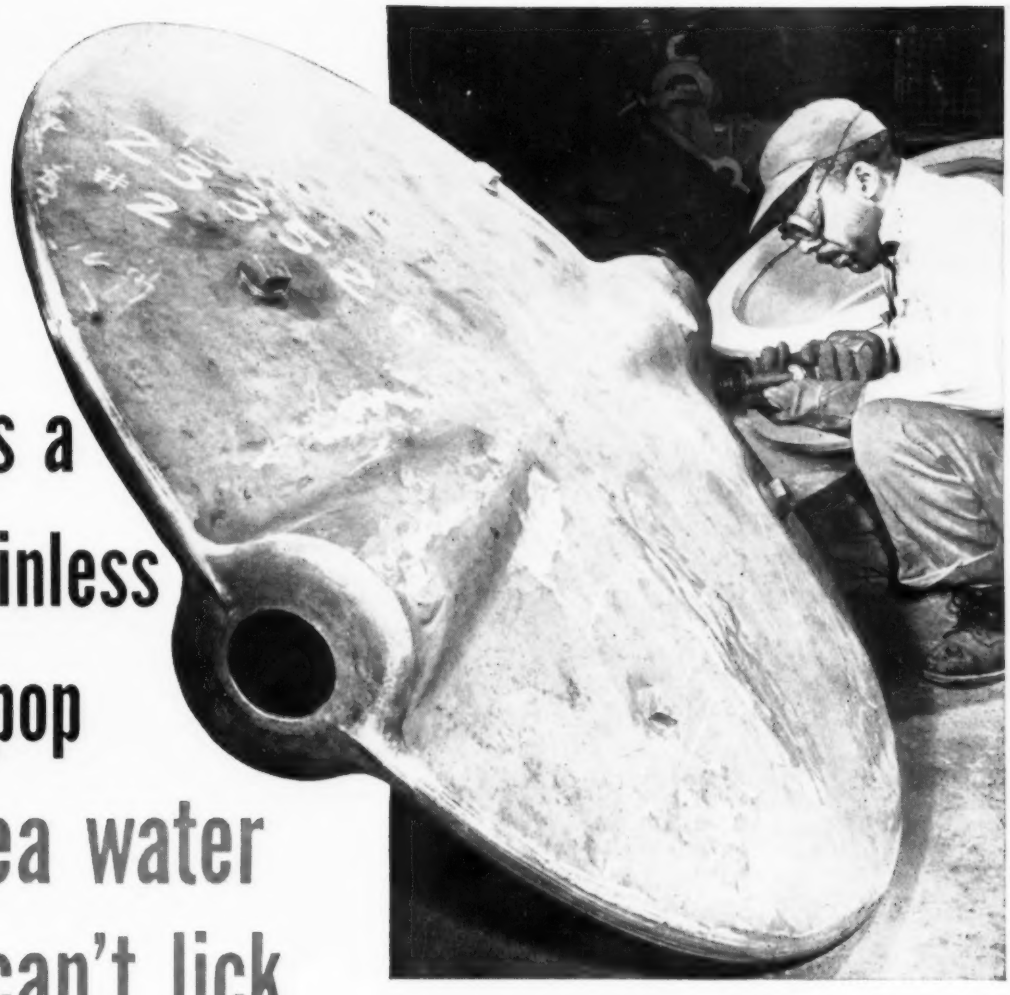
Give us a call and have a talk with one of our "Fastener Engineers."

THE FERRY CAP & SET SCREW COMPANY

Makers of the famous Countr-Bor® Screw for socket head applications.

2157 SCRANTON ROAD • CLEVELAND 13, OHIO

FERRY CAP *is geared to FASTER SERVICE*



Here's a stainless lollipop sea water can't lick

This large (48″ dia., 1701 lbs.) and unusual stainless casting was fabricated by Allegheny Ludlum's Buffalo, N.Y. foundry. It is scheduled for service under the most severe operating conditions, functioning as a wafer valve disc at 25 psi pressure in sea water. Since long life and tight closing are essential in this application, corrosion resistant Type 304 Allegheny Stainless was specified.

Some unusual techniques were employed in the fabrication of this casting. Although the entire valve disc was cast as a single piece, its sides are hollow, with a skin only ¼″ thick. The center shaft was cast solid at the same time the side wings were cored, permitting the single piece, seamless part desired.

If you have a casting problem, or *any* problem that involves corrosion resistance, long life, resistance to wear and abrasion, call the Allegheny Ludlum Sales Office nearest you. An A-L Sales Engineer is ready to put his skills and those of the A-L Technical Staff promptly at your disposal, to serve your requirements from the largest and most complete line of stainless products on the market.

Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pennsylvania.

WSW 6663

Write for this 28-page booklet on A-L STAINLESS CASTINGS

28 pages of valuable and complete data on stainless castings: analyses, properties, technical data on handling and heat treatment, typical applications, how to order, etc.

ADDRESS DEPT. A-931

Make it BETTER and LONGER LASTING with

ALLEGHENY STAINLESS

Warehouse stocks carried by all Ryerson steel plants

Wheels coated with ALUNDUM abrasive give housing covers a fine polish, faster and for less money — like other Norton "Touch of Gold" grains that cover the widest range of polishing operations. ▶

Setting up the wheels shown at right is an easy job. The high capillarity of ALUNDUM polishing grains improves and speeds up the wetting process with glue or cement.

How polishing costs are being cut...NOW

Trend to wheels set up with ALUNDUM abrasive is spreading the money-saving "TOUCH OF GOLD"*

Many plants where polishing jobs are important find that a change-over to wheels set up with Norton ALUNDUM abrasives results in better, faster, lower-cost polishing.

In particular, preferences for S and R type grains are increasing rapidly. The S type, available in 14 to 90 grit sizes, is specially surface-treated to give the abrasive much greater adhesion to glue or cement. The R type, made in 100 to 240 grit sizes, also gets a special surface treatment, to improve its adhesiveness for use with glue only.

Typical advantages common to all ALUNDUM polishing grains include:

- **Uniform grain shape,** that assures a fast, uniform cutting action.
- **Uniform grain sizings,** with no oversize grains that mar the finish, no undersize grains to loaf on the job.
- **High capillarity,** assuring the easy absorption of adhesive that means longer lasting, better performing set-up wheels.

The booklet "Setting Up Metal Polishing Wheels and Belts" contains valuable facts on the various types of ALUNDUM grain . . . on the applications of canvas, leather or wooden wheels . . . and on the best means of preparing wheels, with cement or glue. Ask your Norton distributor for it. Or write to NORTON COMPANY, General Offices, Worcester 6, Mass. Plants and distributors all around the world.

*Trade-Mark Reg. U.S. Pat. Off. and Foreign Countries

G-334

NORTON

ABRASIVES

Making better products . . . to make your products better

NORTON PRODUCTS

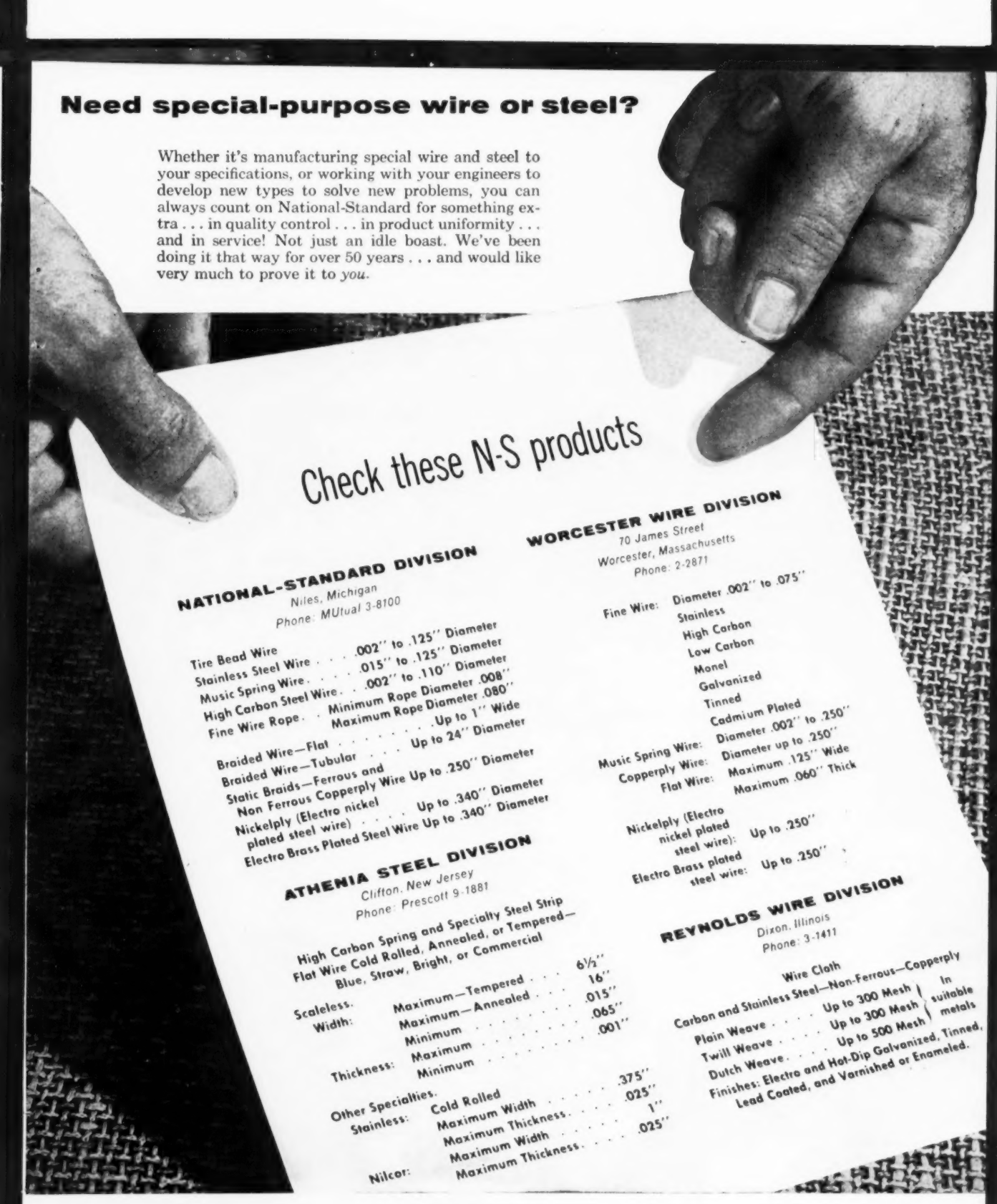
Abrasives • Grinding Wheels • Grinding Machines • Refractories

BEHR-MANNING DIVISION

Coated Abrasives • Sharpening Stones • Behr-cat Tapes

Need special-purpose wire or steel?

Whether it's manufacturing special wire and steel to your specifications, or working with your engineers to develop new types to solve new problems, you can always count on National-Standard for something extra . . . in quality control . . . in product uniformity . . . and in service! Not just an idle boast. We've been doing it that way for over 50 years . . . and would like very much to prove it to *you*.



Check these N-S products

NATIONAL-STANDARD DIVISION
Niles, Michigan
Phone: MUtual 3-8100

Tire Bead Wire . . . .002" to .125" Diameter
Stainless Steel Wire . . . .015" to .125" Diameter
Music Spring Wire . . . .002" to .110" Diameter
High Carbon Steel Wire . . Minimum Rope Diameter .008"
Fine Wire Rope . . Maximum Rope Diameter .080"
Braided Wire—Flat . . . . . Up to 1" Wide
Braided Wire—Tubular . . . Up to 24" Diameter
Static Braids—Ferrous and Non Ferrous Copperply Wire Up to .250" Diameter
Nickelply (Electro nickel plated steel wire) . . . . Up to .340" Diameter
Electro Brass Plated Steel Wire Up to .340" Diameter

ATHENIA STEEL DIVISION
Clifton, New Jersey
Phone: Prescott 9-1881

High Carbon Spring and Specialty Steel Strip
Flat Wire Cold Rolled, Annealed, or Tempered—
Blue, Straw, Bright, or Commercial

Scaleless Width: Maximum—Tempered . . . 6½"
Maximum—Annealed . . . 16"
Thickness: Minimum . . . . . .015"
Maximum . . . . . .065"
Minimum . . . . . .001"

Other Specialties.
Stainless: Cold Rolled
Maximum Width . . . . . .375"
Maximum Thickness . . . . . .025"
Nilcor: Maximum Width . . . . . 1"
Maximum Thickness . . . . . .025"

WORCESTER WIRE DIVISION
70 James Street
Worcester, Massachusetts
Phone: 2-2871

Fine Wire: Diameter .002" to .075"
Stainless
High Carbon
Low Carbon
Monel
Galvanized
Tinned
Cadmium Plated
Music Spring Wire: Diameter .002" to .250"
Copperply Wire: Diameter up to .250"
Flat Wire: Maximum .125" Wide
Maximum .060" Thick

Nickelply (Electro nickel plated steel wire): Up to .250"
Electro Brass plated steel wire: Up to .250"

REYNOLDS WIRE DIVISION
Dixon, Illinois
Phone: 3-1411

Wire Cloth
Carbon and Stainless Steel—Non-Ferrous—Copperply
Plain Weave . . . . Up to 300 Mesh
Twill Weave . . . . Up to 300 Mesh
Dutch Weave . . . . Up to 500 Mesh
In suitable metals
Finishes: Electro and Hot-Dip Galvanized, Tinned, Lead Coated, and Varnished or Enameled.

NATIONAL STANDARD

DIVISIONS: NATIONAL-STANDARD, Niles, Mich.; *tire wire, stainless, music spring and plated wires* • WORCESTER WIRE WORKS, Worcester, Mass.; *high and low carbon specialty wires*
WAGNER LITHO MACHINERY, Secaucus, N. J.; *metal decorating equipment* • ATHENIA STEEL, Clifton, N. J.; *flat, high carbon spring steels* • REYNOLDS WIRE, Dixon, Ill.; *industrial wire cloth*

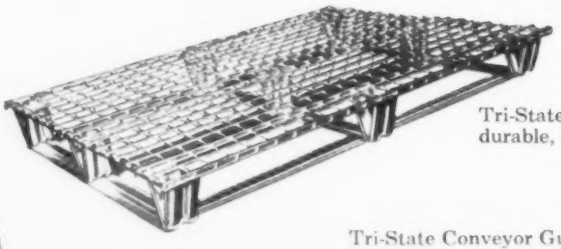
Now...

TRI-STATE ENGINEERING COMPANY—manufacturers of

CARGOTAIN

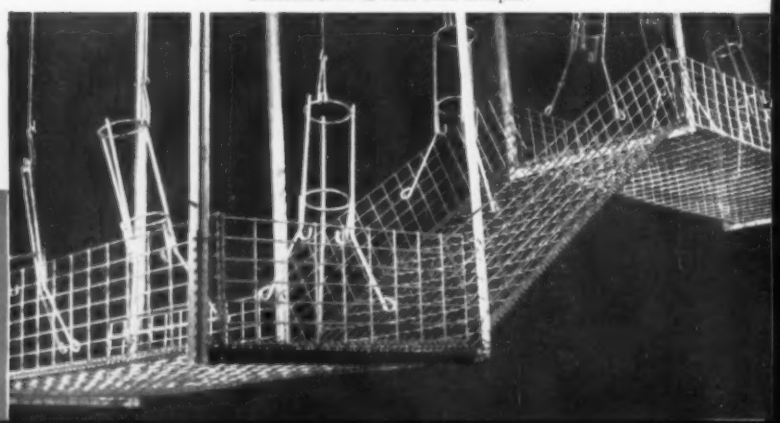
...resumes handling the sales and service of our patented heavy duty steel wire containers, pallets, conveyor guard and other material handling equipment through our own marketing organization.

*Reg. U. S. Pat. Off.
U. S. Pat. No. 512417



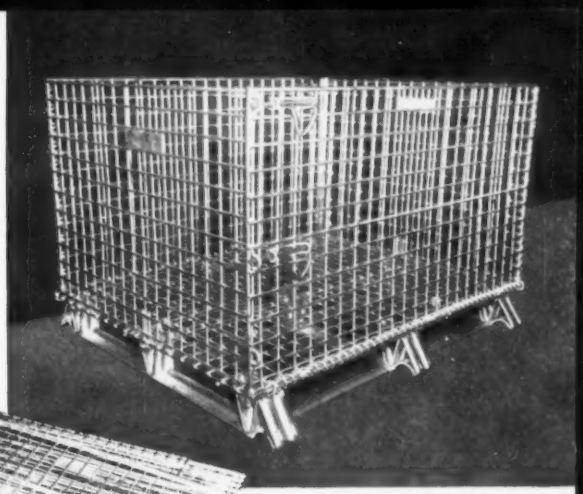
Tri-State Pallets are light, strong, durable, easy to handle.

Tri-State Conveyor Guard has the strength for adequate protection, and installation is fast and simple.



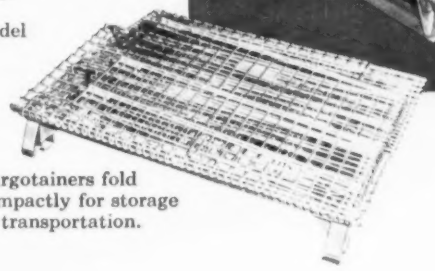
Elimination of center legs on Clearview model permits use with any type of moving equipment.

Clearview Model

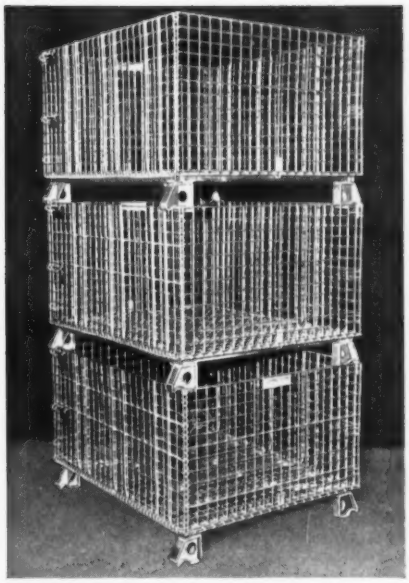


Stripbase Model

ERS*



Cargotainers fold compactly for storage or transportation.



All models stack easily and firmly.

CARGOTAINER is the registered trade name of a line of heavy duty steel wire containers developed by Tri-State Engineering Company which have been widely accepted throughout industry. These containers are used for handling, storing and shipping a wide range of industrial parts, components and finished products.

Tri-State introduced CARGOTAINERS in 1946, and has been manufacturing them ever since. Other products in our line are Pallets, Conveyor Guard and other material handling equipment, also developed and manufactured by us.

For the first few years after CARGOTAINERS were introduced, we marketed them ourselves. Later, in order to concentrate on the manufacturing problems created by the rapid growth in demand for this product, we entered into a sales agreement with another company. This agreement was terminated as of September 1, 1957.

Now, Tri-State Engineering Company is again selling our products through our own salesmen and dealers. We believe that this direct contact, through our own organization, will enable us to give you better service and, of course, the same high quality in materials and workmanship which have set such high standards for our line of material handling equipment.

B. R. BECKNER,
President

CARGOTAINER
DIVISION

TRI-STATE ENGINEERING COMPANY

Washington, Pennsylvania

Manufacturers of Cargotainers, Pallets, Conveyor Guard and other Material Handling Equipment

Scott Wipers* are wonderful for wiping oily machines, tools, hands, face! They're soft, absorbent, 2-ply paper chemically treated and Perf-embossed.® This exclusive process creates angled surfaces for perfect cleaning action, fast absorption of liquids. *PATENT PENDING

WIPER PROBLEM? Look what National Broach and Machine did with Scott Wipers!

National Broach & Machine Company, Detroit, is the world's largest producer of gear finishing machines. Management switched to Scott Wipers, after long use of rags for industrial wiping, because:

a) Scott Wipers were found to be less expensive, lint-free, uniform, more sanitary, easily disposable.

b) Scott Wipers help maintain good housekeeping.

c) Scott Wipers, furnished to each user, save much time formerly lost in going after clean wipers.

d) Scott Wipers fresh from the box are always clean—no clinging metallic particles to scratch and cut.

Today, Scott Wipers are used by this firm for 80% of all wiping needs: machines, tools, stock, instruments, hands, faces, workers' glasses. They have effected a saving of nearly $2,000 annually!

If you'd like to improve your wiping operation like this, call your local Scott distributor or write Scott Paper Company, Department IA-79, Chester, Pennsylvania.

SCOTT PAPER

Maker of the famous Scott paper products you use at home. See "Father Knows Best" and "The Gisele MacKenzie Show" on NBC-TV.

To Solve Your Metal Cutting Problems — Your Victor Distributor Will Help You Select the Right Victor Blade For Every Job!

To get better cutting for lower cost —use long-lasting Victor Hack Saw Blades

The longer life of VICTOR "Moly"® High Speed Blades reduces your metal cutting costs.

These efficient VICTOR "Moly" High Speed Blades perform efficiently and economically on all types of hard-to-cut metals.

All Victor Hack Saw Blades are built to give you features that assure top-notch results

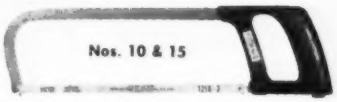
Every blade is uniformly heat treated and tempered to an exact degree of hardness. They have efficient tooth design for fast, smooth cutting. Balanced set gives you proper clearance, more accurate cuts. Clear markings make for easier, quicker identification. Victor pioneered the molybdenum steel hack saw blade to meet the toughest requirements. Always insist on high-quality Victor Hack Saw Blades for outstanding performance and maximum economy.

VICTOR

SAW WORKS, INC. • MIDDLETOWN, N.Y., U.S.A.

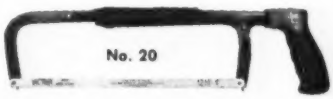
Makers of Hand and Power Hack Saw Blades, Frames and Metal and Wood Cutting Band Saw Blades

® 4866



No. 10 — Yellow molded handle. Shaped for comfort. Almost indestructible!

Patented Lever-Lock positions, tensions blades *automatically*. **No. 15** — Red molded handle, chrome-plate finish. Same features as No. 10.



No. 20 — Gunmetal Finish, features adjustable pistol-grip Frame, Lever-Lock for extra-easy blade change.

FREE — FOR THE SHOP . . . the Victor Metal Cutting Chart — an invaluable on-the-spot guide for shop metal workers.

FREE — FOR YOU . . . Victor's Handy METAL CUTTING GUIDE . . . packed with valuable information on blade types, cutting techniques . . . feeds and speeds . . . plus important general metal cutting information.

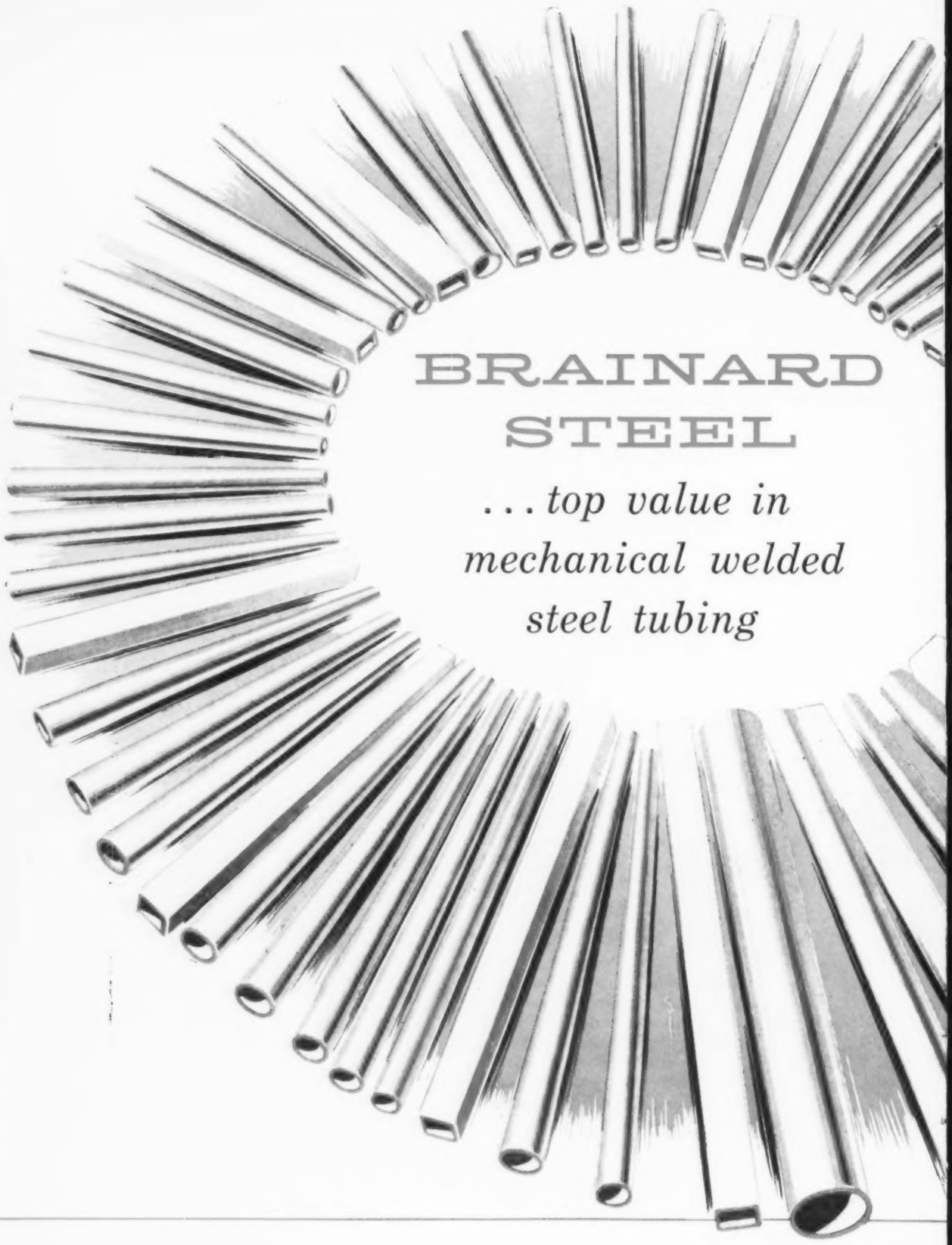
VICTOR SAW WORKS, INC.
Middletown, N. Y., U. S. A.

☐ Please send me the Victor Metal Cutting Chart
☐ Please send me the Victor Metal Cutting Guide

Name _____ Title _____

Address _____

City _____ Zone _____ State _____


BRAINARD
STEEL
... top value in
mechanical welded
steel tubing

BRAINARD mechanical welded steel tubing is a top value buy because they give assured quality at competitive prices. Brainard Tubing, in sizes from ½" to 4" is also available in squares, rectangles, and special shapes.

VALUE = QUALITY / PRICE = BEST BUY!

Buying from Brainard has hidden values too!

DELIVERY! As a division of Sharon Steel, Brainard is assured of a constant supply of all grades of steel and can meet your delivery schedules.

VERSATILITY! Available in special shapes. Brainard Electric Welded Steel Tubing can also be swedged, pressure tested and delivered in many fabricated forms.

SERVICE! With a growing field organization, Brainard has representatives in all major cities and that's not all — Brainard will quote your requirements in short order.

so buy Brainard

SEND FOR THIS BOOKLET
For complete information on Brainard's Mechanical Welded Tubing.

BRAINARD STEEL TUBING
Griswold St., Warren, Ohio

Name _____

Address _____

City _____ Zone ____ State ____

Brainard Steel Tubing

SHARONSTEEL

Brainard Steel Division, Sharon Steel Corporation
Griswold Street, Warren, Ohio

CYLINDRICAL APPLICATIONS:

UNLIMITED

Sandusky Centrifugal Castings offer you 4 Important Advantages

1. Superior mechanical properties to meet exacting design requirements
2. Uniform soundness—free from harmful inclusions and porosity
3. Highest quality—to insure long, dependable, trouble-free service
4. Job-ready castings—machined to your exact specifications

More and more design engineers are realizing that new applications for centrifugal castings are *unlimited* . . . thanks to new knowledge about alloys . . . new casting and machining techniques and facilities.

From simple bushings to atomic reactor components . . . from bronzes to heat, corrosion, and abrasion resistant stainless steels . . . from 7" to 54" O.D. and lengths to 33 ft.—Sandusky centrifugal castings are providing gratifying results in scores of applications, many unheard of a few years ago.

What cylindrical or piping problem can we help you solve? . . . Code pressure vessels? . . . Reactor vessels? . . . Power Piping? . . . What is your problem?

Your inquiry will bring more information promptly . . . or, if you prefer, a personal call by one of our engineers.

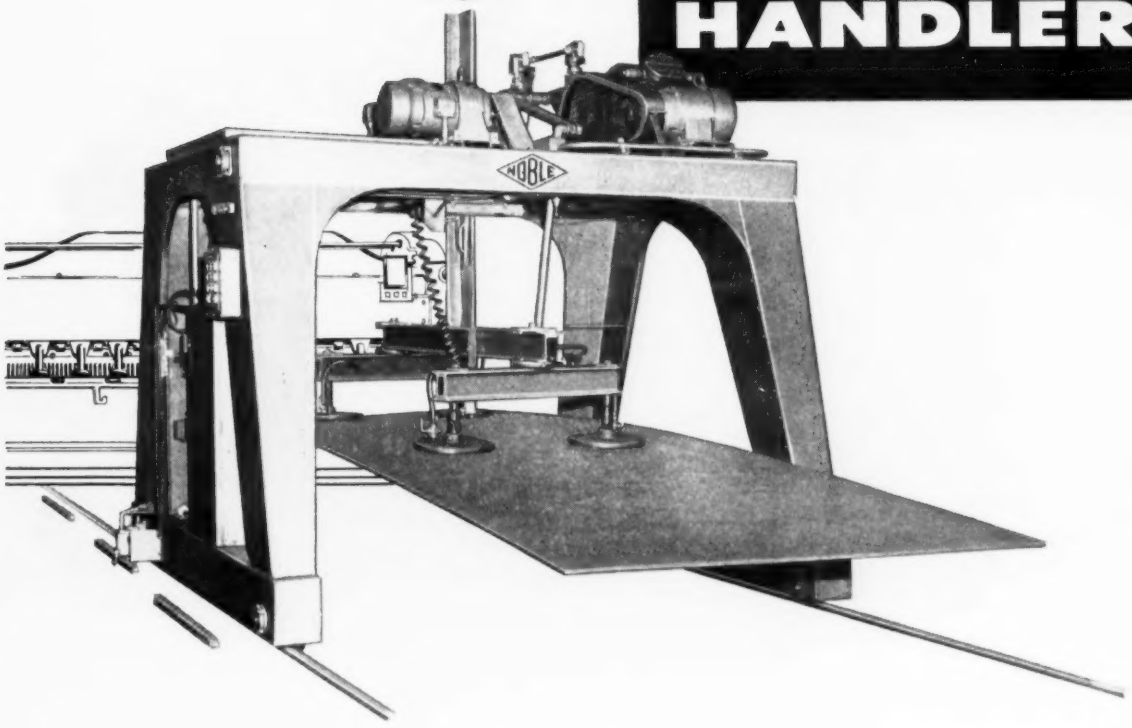
CENTRIFUGAL CASTINGS

Sandusky Foundry & Machine Company

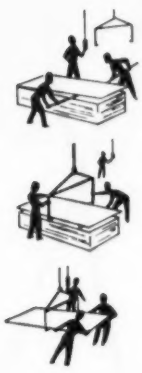
SANDUSKY, OHIO • Stainless, Carbon, Low Alloy Steels—Full Range Copper-Base, Nickel-Base Alloys

How to Make Your Shear a Production Tool

–ADD A NOBLE *Automatic* PLATE HANDLER



Faster Plate Handling at Lower Cost



The NOBLE Automatic Plate Handler eliminates the 3 slow, costly and often dangerous manual operations sketched at left. The usual 2- or 3-man crew needed to pry up the plate, attach lifting hooks, operate the crane or hoist and move the plate into position is eliminated. At a touch of the control button, your NOBLE Automatic travels to the stack, picks up a plate, raises it to proper height, brings it right to the ball points or casters and puts it into position for shearing, punching, or whatever operation is required. Machine operators and their helpers spend their time on production, not manhandling plate!

LESS IDLE MACHINE TIME...

With a NOBLE Automatic on the job, there's always a plate ready at the machine — no idle standby while operators help wrestle another one off the pile and onto the feed table. You get maximum earning power out of your machine investment.

INCREASED PRODUCTION...

The natural result of reduced idle machine time and faster plate handling. NOBLE Automatic Plate Handler users report a gain of 20% or more, depending on type of application.

THREE TYPES AVAILABLE...

Standard NOBLE automatic plate handling systems are available in floor-mounted rail, overhead rail and radial transfer types. Standard capacities are 1,000, 2,000, 3,000 and 4,000 lbs.

NEW BROCHURE AVAILABLE... describes economies of automatic plate handling, proper applications, typical system layouts, and all NOBLE equipment involved. Write for your free copy today; please address Dept. I-8.

NOBLE COMPANY

1860 Seventh Street
Oakland 20, California

55 YEARS AND STILL AT IT!

developing new equipment ideas for the improved production of ferrous and non-ferrous...

PIPE • TUBES • BARS SHEET AND STRIP

some current ones you will be hearing about soon:

Mandrel-Type Uncoiler-Leveller for supplying skelp continuously to Continuous Butt Weld Pipe Mills.

Multi-Strand Cold Tube Rolling Mill for production of small diameter tubing.

Pipe End Facing and Beveling Machine finishes ends of pipe automatically.

Coil handling device for placing coils in either horizontal or vertical position.

AETNA • STANDARD

THE AETNA-STANDARD ENGINEERING COMPANY

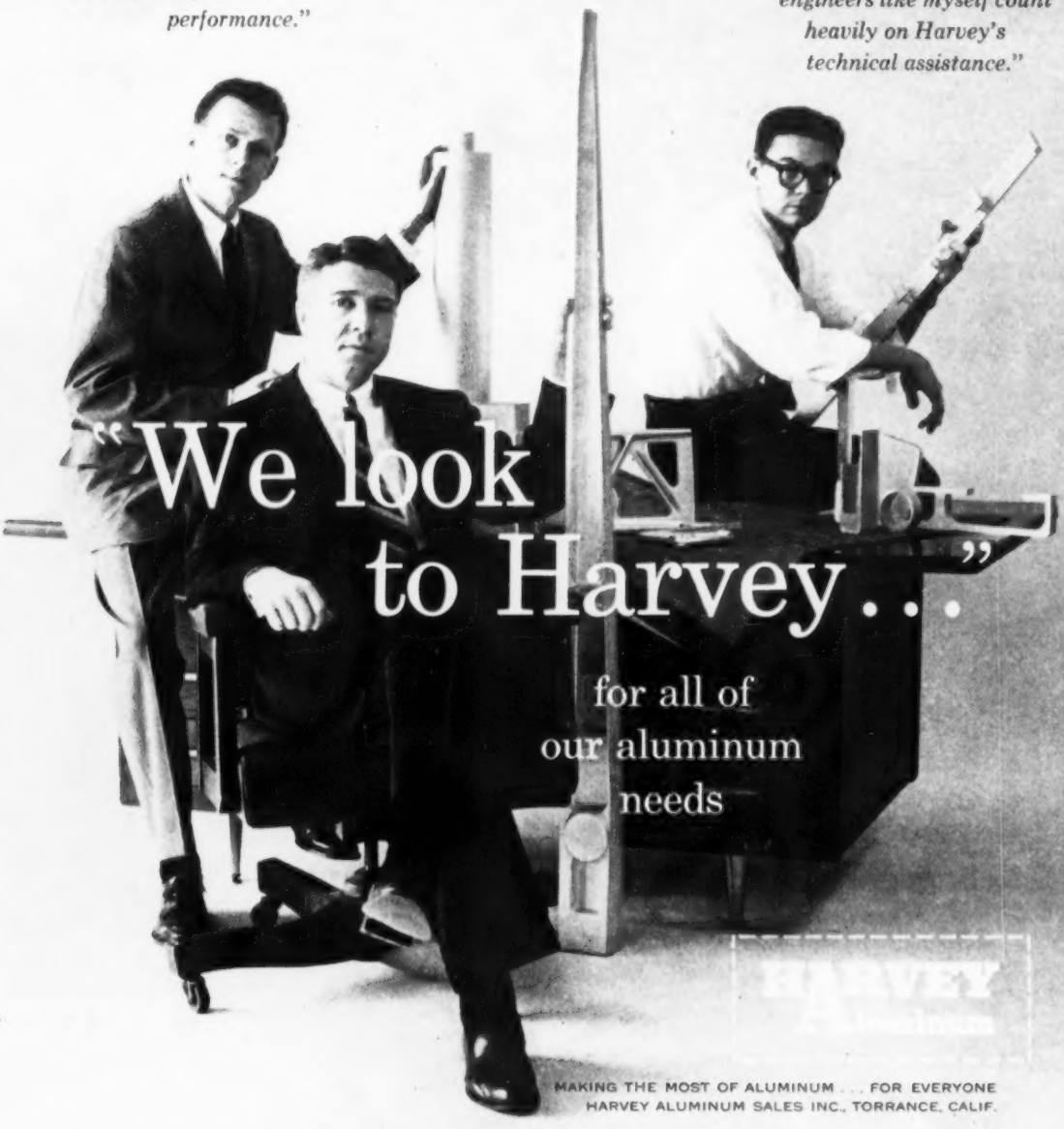
GENERAL OFFICES: PITTSBURGH, PA. • PLANTS: ELLWOOD CITY, PA., WARREN, OHIO • PROCESS LABORATORY: AKRON, OHIO

CONTINUOUS GALVANIZING LINES • CONTINUOUS ELECTROLYTIC TINNING LINES • SIDE TRIMMING AND SHEAR LINES AND OTHER FINISHING EQUIPMENT • CONTINUOUS BUTT WELD PIPE MILLS • SEAMLESS TUBE MILLS • DRAWBENCHES AND OTHER COLD DRAW EQUIPMENT • ROLLS AND CASTINGS • EXTRUDERS, MILLS, PRESSES FOR RUBBER AND PLASTIC

"As a purchasing man... I know that the best measure of a supplier is dependability. These impact extrusions are a good example of Harvey's dependable performance."

"Harvey is our prime source for light and heavy press extrusions and forgings. From management's viewpoint, we can always rely on Harvey's traditional high quality and service."

"Material from Harvey gives us all the inherent advantages made possible by the latest production equipment, complete laboratory and test facilities, and exacting quality control. That's why design engineers like myself count heavily on Harvey's technical assistance."



"We look to Harvey..."

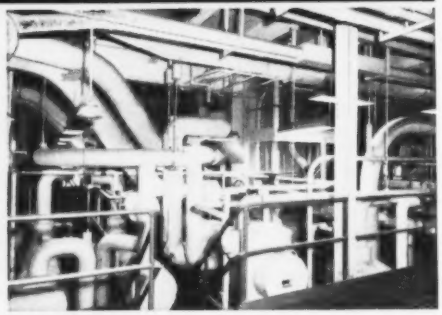
for all of our aluminum needs

MAKING THE MOST OF ALUMINUM . . . FOR EVERYONE
HARVEY ALUMINUM SALES INC., TORRANCE, CALIF.

Harvey is a leading independent producer of quality aluminum products in all alloys and sizes: Rod and bar, pipe, tube, hollow sections, press forgings, forging stock, impact extrusions, structurals, special shapes, extrusions, screw machine products and other aluminum products. Harvey is also producing similar items in titanium and steel.

NEW AUTOMATED McKAY RIM

BLAW-KNOX has what it takes—to provide these products and services



Heater piping system in this modern generating station is typical of many high temperature, high pressure systems prefabricated and erected by Blaw-Knox. Experienced piping engineers, modern shop facilities and a new Blaw-Knox digital computer method for fast, accurate calculation of piping stresses are available to you. Let us know your requirements and we'll provide the service you need. For more information, write for Bulletin No. 2443—"Piping for Industry."

Out of every 100 firms who lose their records in a fire, 43 never reopen for business. Be safe. Let a Blaw-Knox fire-protection engineer study your needs—and explain how you can pay for the system on our lease or deferred payment plan. To get more information send for Bulletin No. 2426—"Fire Can Destroy Your Business."

Blaw-Knox trapeze functional spring hanger installed in first large atomic generating station. Vital power piping system for the atomic generating unit in the Duquesne Light Company's Shippingport Station is supported by Blaw-Knox custom-engineered hangers.

Blaw-Knox makes a complete line of standard and custom-engineered pipe hangers, supports, and vibration eliminators. Each is a complete packaged unit, designed for a specific purpose and constructed to comply with the "code for pressure piping." Available in types and sizes to meet varying conditions, ready to install.

Blaw-Knox engineers, who have solved many difficult hanger and piping vibration problems, are always available to both design and make recommendations for your hanger requirements. For further information, write for Catalog No. 54.

BLAW-KNOX

BLAW-KNOX COMPANY

Power Piping and Sprinkler Division

829 Beaver Avenue • Pittsburgh 33, Pennsylvania

Complete facilities for prefabrication and erection of piping systems for all pressures and temperatures
...complete line of standard and custom-engineered pipe hangers, supports and vibration eliminators
...complete line of automatic sprinkler systems for standard and special hazards

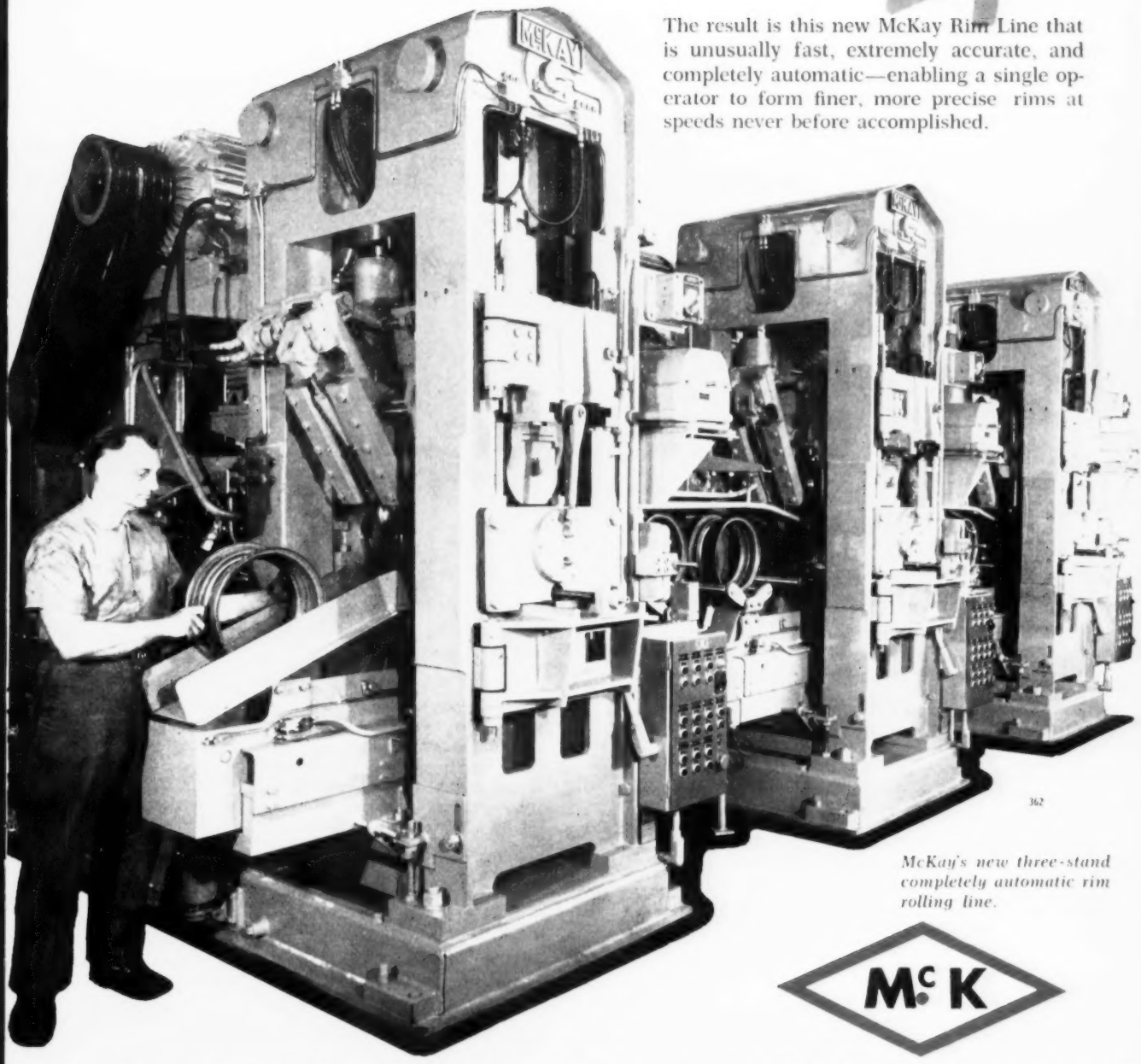
NEW, AUTOMATED McKAY RIM LINE SPEEDS PRODUCTION OF PRECISION WHEELS FOR TUBELESS TIRES

The advent of the tubeless tire, coupled with ever increasing labor costs, pushed wheel manufacturers to request machines that could turn out better rims at faster rates.

Because McKay Machine engineers know this business better than any other group in the nation, they accepted the challenge.

BETTER RIMS ... automatically

The result is this new McKay Rim Line that is unusually fast, extremely accurate, and completely automatic—enabling a single operator to form finer, more precise rims at speeds never before accomplished.



McKay's new three-stand completely automatic rim rolling line.

McK

THE McKAY MACHINE COMPANY • YOUNGSTOWN, OHIO

Something new... made better by aluminum

Super-purity aluminum has helped set a new standard in gasoline performance . . . new standards in metal brilliance and workability.

From high-power gasoline to high-fashion jewelry . . . super-purity Aluminum is making news

The new third pump in filling stations across the continent is one more symbol of aluminum's amazing versatility. For these higher octane gasolines are produced by a new catalyst—made possible by super-purity (99.99+%) aluminum. And Canada's Aluminium Limited, alone, supplies two thirds of this super-purity metal used by the North American oil refining industry.

In Metalworking too

Super-purity aluminum is also being used more and more in quality metalworking. For no other metal of such easy workability can be polished to such a brilliant and long-lasting lustre. This unique combination of properties has proven invaluable to makers of reflectors, jewelry, tableware, and decorative trim for higher priced automobiles and modern buildings.

Canada a logical source

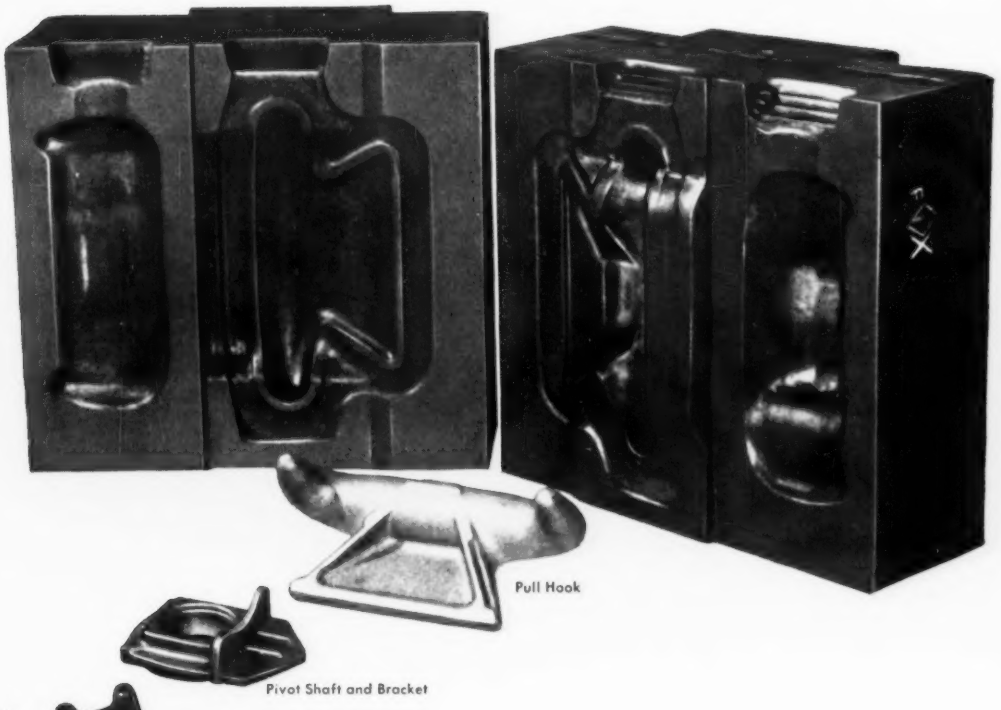
To produce super-purity aluminum requires twice as much electric power as the commercial grade. That's why Aluminium Limited with its vast hydroelectric installations in Quebec and British Columbia is such a logical source. Once again this independent Canadian producer's natural role as a supplier of primary aluminum is serving the skills of American fabricators to create new products made better by aluminum.

Supplying U. S. industries with primary aluminum from Canada

Aluminium Limited *Sales, Inc.*

630 FIFTH AVENUE • NEW YORK 20, N. Y.

CLEVELAND • CHICAGO • DETROIT • LOS ANGELES • BUENOS AIRES • SÃO PAULO



USE FINKL DIE BLOCKS FOR QUALITY FORGINGS...

farm equipment manufacturers do!

International Harvester Company's Tractor Works, for one, uses Finkl die blocks to produce numerous tractor parts such as the pivot shaft bracket, pull hook, track link, equalizer spring saddle, and draw bar bracket shown on this page.

Because of the high volume production of these Crawler Tractor parts, Finkl FX die blocks are used at Harvester's Tractor Works to produce more forgings per sinking, and more sinkings per die. The special machining quality reduces die sinking time, without impairing the heat or wear resistance of the dies in production.

Finkl die blocks are available in several grades, all sizes, and tempers to handle virtually any forging requirement. Call your local Finkl representative next time you are considering die blocks or forgings. He will be glad to help you and there is no obligation.

DIE BLOCKS · FORGINGS · HOT WORK STEELS · ELECTRIC FURNACE STEELS

A. Finkl & Sons Co.

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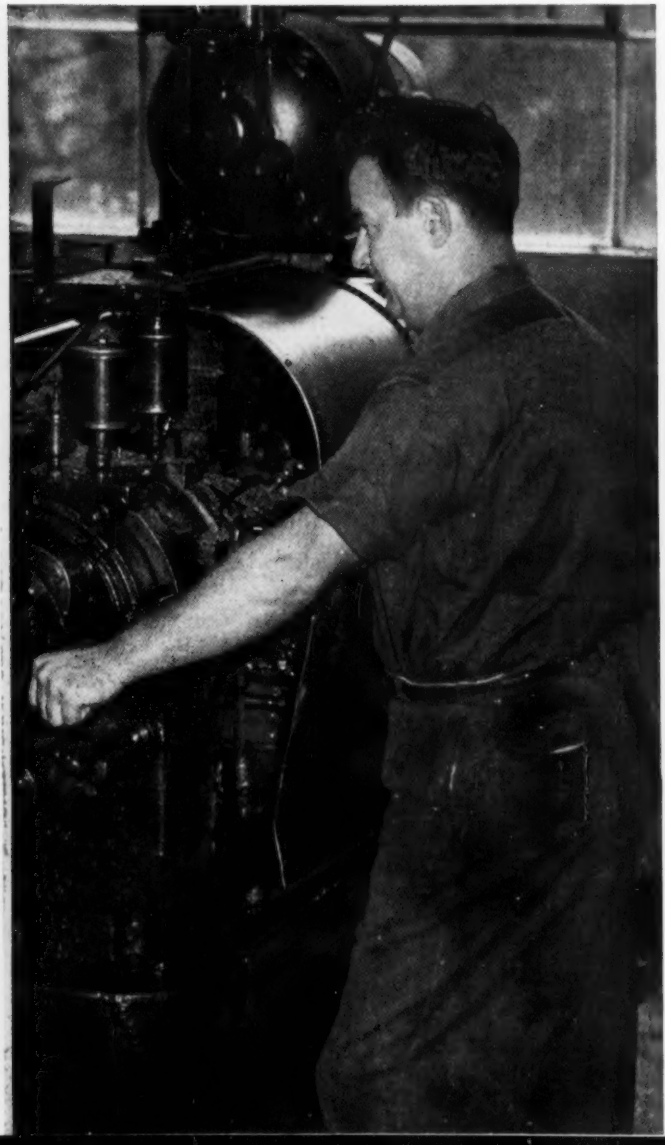
They cut out three oils by changing to one...

Standard Oil lubrication specialist Bob Cleland and plant manager I. G. Smallegan inspect work furnished by operator Dick Stockwell. Giving technical help to customers like this is something for which Bob Cleland is well fitted. Bob has a mechanical engineering degree from Michigan State and has completed the Standard Oil Sales Engineering School.

STANICUT Oil 166 BC

Screw machine plant saves on oil inventory and handling, receives other benefits by converting to dual-purpose cutting oil.

Grand Rapids Metal Products Company's problem was the mixing of cutting and lubricating oils in their National Acme and Gridley screw machines. In all, four oils were used. In some machines a cutting oil, two lubricating oils and a base oil were employed to improve machining characteristics. Lubricating oil leaking past seals mixed with the cutting oil, reducing cutting oil qualities. Oil mixtures were constantly varying, and troubles in tapping resulted.



Standard Oil's Bob Cleland, working with plant management, suggested STANICUT Oil 166 BC. This oil, he explained, is a dual-purpose oil. It can be used for lubrication as well as for cutting, and no dilution of the cutting oil can occur.

After a week's trial in one machine, the entire plant was converted to STANICUT Oil 166 BC. Tap troubles were reduced, resulting in much less down time. Spindle speeds have been increased, yet the spindles run cool. Oil inventories have been reduced from four to one.

STANICUT Oil 166 BC does not corrode bearings, gears, bushings, spindles or other machine parts. While STANICUT Oil 166 BC contains E.P. additives, it does not stain copper or brass.

Get the facts on how STANICUT Oil 166 BC can help you. Call the Standard Oil office nearest you anywhere in 15 Midwest and Rocky Mountain states. Or write to Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

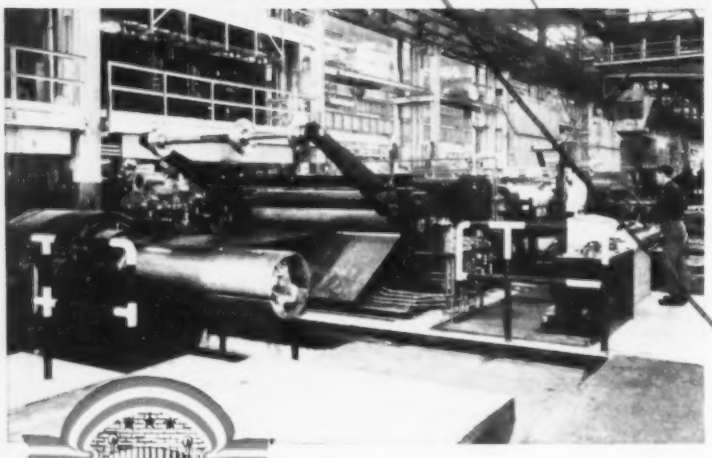
Quick facts about
STANICUT OIL 166 BC

1	A dual-purpose oil — suitable for both cutting and lubrication.
2	Non-corrosive to work or machines.
3	Formulated with E.P. additives.
4	Stable under all normal conditions.
5	Non-irritating.
6	A cutting oil that permits high operating speeds.
7	Non-staining to either copper or brass.

STANDARD

STANDARD OIL COMPANY
(Indiana)

One of the largest slitting & coiling lines



60,000 pound, 75 inch wide—
Slitting and Coiling Line

Years of experience have given us the ability to furnish equipment to meet every slitting and coiling requirement. Bulletin SC55 gives our complete story. Ask for it on your letterhead. No obligation.

Photos show Stamco slitting and coiling unit in cold strip mill

LAY YOUR SLITTING PROBLEMS AT STAMCO'S DOOR

STAMCO, Inc., New Bremen, Ohio

cool metal for hot planes

For jet and rocket aircraft engines, wings and surfaces that are subject to extreme conditions of heat, friction and corrosion, where the metal *must stand up* . . . design it, improve it and protect it with McLOUTH STAINLESS STEEL.

specify

McLOUTH STAINLESS STEEL

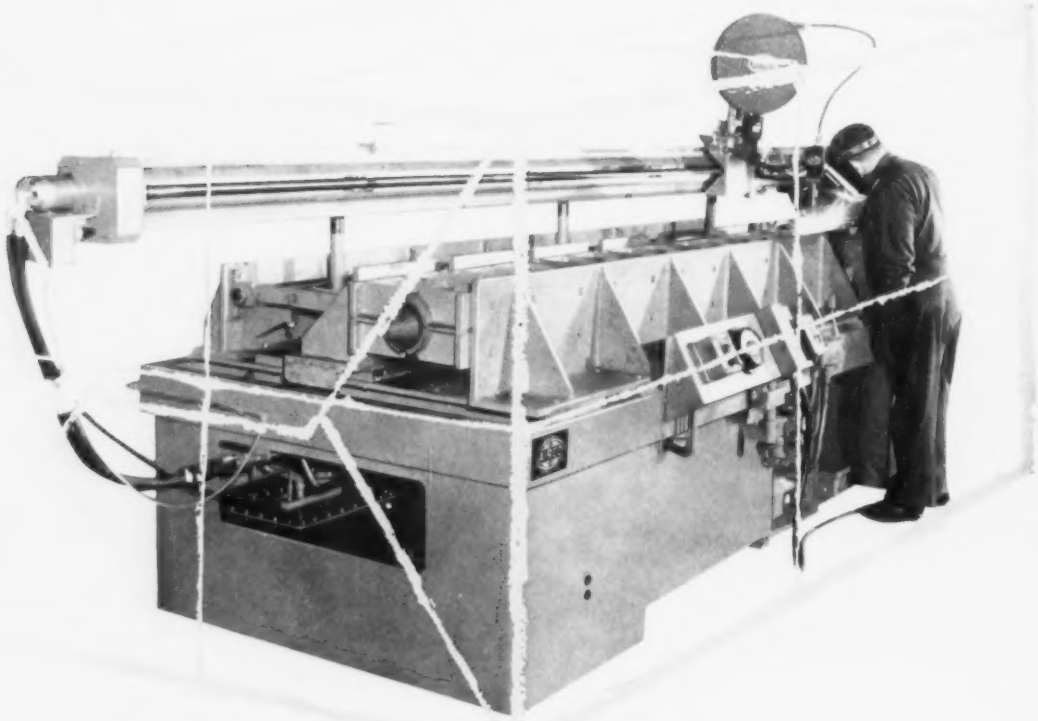
HIGH QUALITY SHEET AND STRIP

for aircraft

McLOUTH STEEL CORPORATION DETROIT, MICHIGAN

MANUFACTURERS OF STAINLESS AND CARBON STEELS

Manufacturer of heat treating equipment using an Airco machine welding installation to fabricate all-sheet alloy radiant furnace tubes used in annealing furnaces. The "package" includes all welding equipment, fixtures and controls tailored to specifications to produce welds automatically of the size, quality, type and speed required.



AIRCO PACKAGED MACHINE WELDING

Airco's Machine Welding Department can relieve you of many of the problems involved in installing an automatic welding operation in your plant. This welding-and-engineering service custom engineers automatic welding operations to your product design. Airco designs, constructs and installs all welding machine tools. Airco selects the most suitable welding equipment for the job, supervises installation, works out "bugs," and trains your employees in the operation of the equipment. You get a completely engineered "package."

Airco accepts full responsibility until the system is operating to your complete satisfaction. Airco's Machine Welding Department has already completed over 36 projects covering a wide range of automatic welding operations. For more information, write to J. H. Berryman, Machine Welding Department, at the address below.

AT THE FRONTIERS OF PROGRESS YOU'LL FIND . . .

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A division of Air Reduction Company, Incorporated
150 East 42nd Street, New York 17, N. Y.

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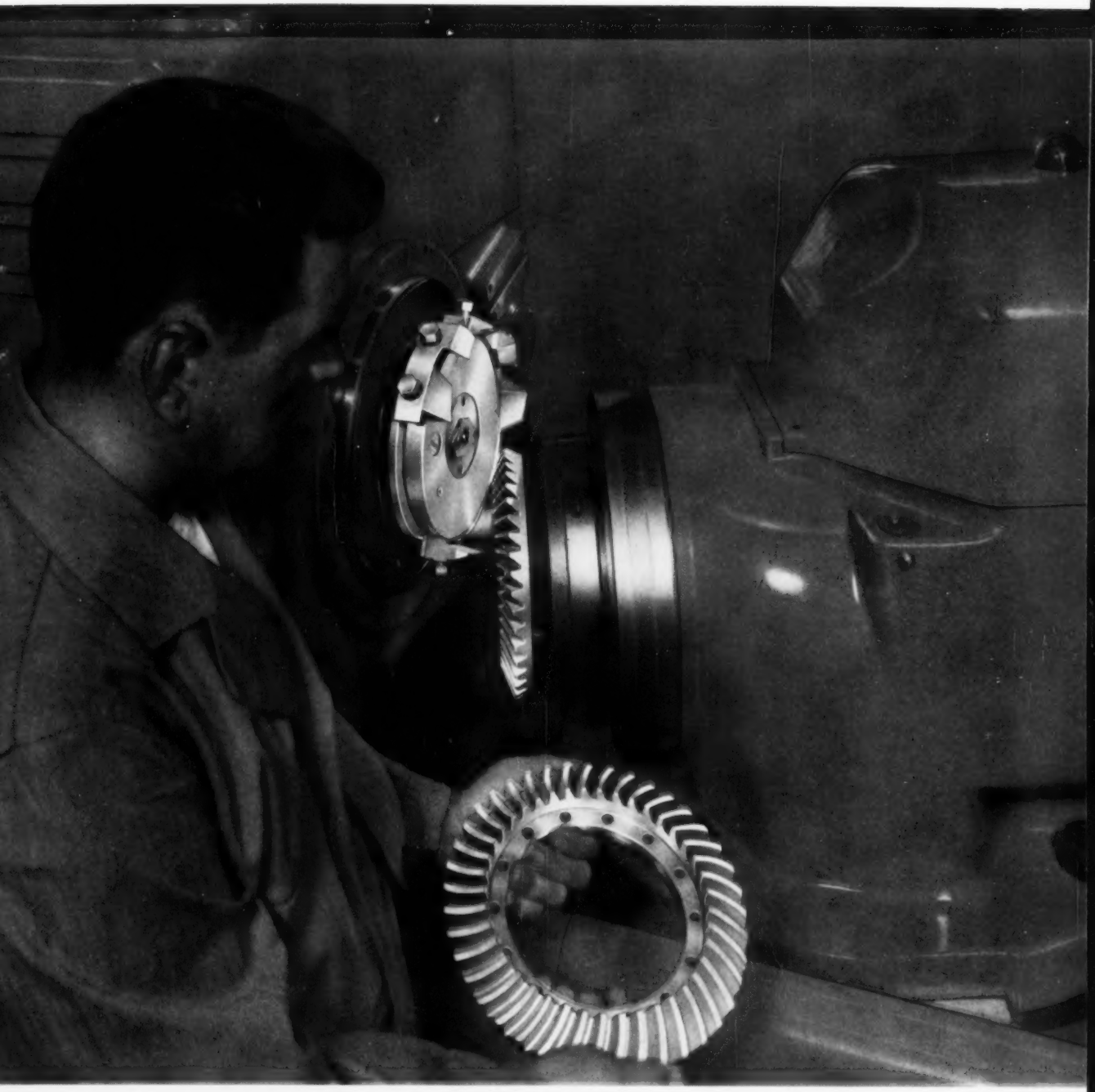


Helixform*—a new method for bevel gear production!

The new No. 112 Hypoid Helixform Gear Finisher assures improved quality and increased production on spiral bevel and hypoid non-generated ring gears up to 10½" in diameter, and 2½ DP such as employed in passenger car axles.

The Helixform Cutting Method used on this machine offers these advantages:

Conjugate tooth surfaces, minimized gear development, complete control of tooth bearing, and greater adjustability in final assembly.

We will be glad to send a bulletin giving further details on request. Ask for literature on the No. 112 Hypoid Helixform Gear Finisher and the companion No. 112 Hypoid Gear Rougher. Write for it today.

*Trade-Mark

GLEASON WORKS

1000 UNIVERSITY AVE., ROCHESTER 3, N.Y.

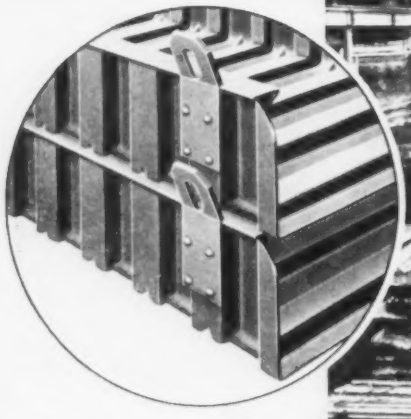
63-A

BEFORE AND AFTER PICTURES PROVE...

REPUBLIC BAR CARRIERS

BEFORE Republic Bar Carriers, materials were piled wherever space allowed. Handling operations were impeded. Inventory control was practically impossible.

AFTER Republic Bar Carriers were installed, materials could be handled quickly and easily. Valuable floor space was saved. Materials became easily accessible.



CARRIERS are equipped with crane-handling lugs which also permit stacking. Corrugated steel construction provides strength, assures long service life at lowest per-year-cost.

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels

save space, speed handling, make materials easily accessible

SAVE SPACE with Republic Steel Pallet Racks. They provide a practical, economical way to palletize and stack bulky, uneven, fragile materials. Tubular steel supports adjust every six inches to handle palletized material of any height. Two-way entry permits loading and unloading from either side. Select single pallets from any level without restacking. Send coupon for complete description, specifications and quotations.

Before Republic P-135 Bar Carriers went to work in this plant of a nationally known manufacturer*, materials of varying sizes and types were piled up just as they were received on shipment. To move a specific item to the production area required many handling operations. It was both costly and time-consuming.

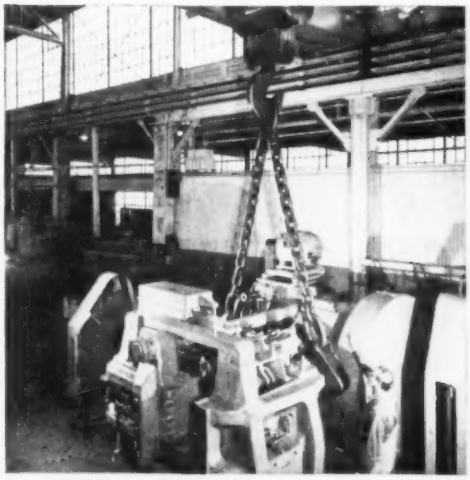
Then the company purchased and put to work a battery of Republic Bar Carriers. These units are ideally suited to handling groups of various size materials with lengths longer than the carrier.

Note in the "after" photo how materials are efficiently separated according to size and type. There's no inventory problem here now. Note, too, how tiering of the carriers saves space. Open-end construction permits easy accessibility to items at any spot in the tier—whether at top or bottom.

These units can also be used to advantage in handling pipe, tubing, angle irons, reinforcing rods, mouldings, extrusions, narrow-width sheets and plates, and many other materials characterized by narrow dimensions. Length, width and height of Republic Carriers can be designed to meet your specific requirements.

The Republic P-135 Bar Carrier may be the solution to your handling problem. Or you may require the design of a completely new unit. Our engineers will help you without obligation. Contact your Republic Materials Handling Representative for more information. Or mail the attached coupon.

**Name on request.*



SPEED HANDLING of heavy, bulky materials like machinery with Republic Chain Slings. They are made to your requirements in Alloy Steel, High Test Steel and Wrought Iron. All are proof tested and warranted to meet or exceed specifications. Because each grade of material has advantages over the other, depending upon application, we recommend talking over your requirements with a Republic Chain Engineer. Send coupon for more data.

STEEL

and Steel Products

REPUBLIC STEEL CORPORATION
Dept. C-2826-R
3104 East 45th Street
Cleveland 27, Ohio

Send more information on:

☐ P-135 Bar Carriers ☐ Chain Slings ☐ Pallet Racks

☐ Have a Materials Handling Engineer call.

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

NEW WELDCO Pipe Testing Machine

WELDCO Installation in the St. Henry Works of The Steel Co. of Canada, Ltd.

WELDCO Automatic Pipe Testing Machines test up to 1,000 pieces of pipe per hour . . . 1/2" through 4" in single, random lengths.

- Fully automatic on uniform lengths, and require only one man to operate.
- Maximum test pressure up to 5,000 psi.
- Low initial cost.
- Controls are all on one panel—for convenient, fast operation.
- Easy manual adjustment for random lengths—in a matter of seconds!
- Advanced design . . . for low-cost maintenance and trouble-free operation.

It will pay you to get the rest of the story. Just phone or write us today.

WELDCO

THE YOUNGSTOWN WELDING & ENGINEERING CO.
3724 OAKWOOD AVE. · YOUNGSTOWN 9, OHIO

Better duck, Princess Wenatchee! Because it sure looks like "Old Pro" Chief Keokuk is seeing birdies instead of shooting them. Crafty Junior is back on green pastures with a nifty exhibition of blasting from a trap!

Trapped by rising costs and ways to control quality? Foundries and steel plants who are old pros at the game have paired up with Keokuk Silvery to break par day after day. They know Keokuk Silvery Pig Iron is the superior form of silicon introduction . . . that pig for pig, car for car, its dependable uniformity never varies! Handle by magnet, charge by weight or count the pigs for equal accuracy. Aluminum producers . . . you'll have a par-busting partner in Keokuk Silicon Metal. Try it!

KEOKUK ELECTRO-METALS COMPANY
Keokuk, Iowa
Wenatchee Division, Wenatchee, Washington

When you think of SILICON, think of KEOKUK!

KEOKUK SILVERY PIG IRON

SILICON METAL—OTHER FERROALLOYS

Keokuk Silvery Pig—the superior form of silicon introduction for foundries and steel plants—is available in 60 and 30 lb. pigs and 12½ lb. piglets in standard analysis or alloyed to your specifications. Silicon metal and ferrosilicon are supplied in standard sizes and analyses.

SALES AGENT: MILLER AND COMPANY
332 S. Michigan Ave., Chicago 4, Illinois
3504 Carew Tower, Cincinnati 2, Ohio
8230 Forsyth Blvd., St. Louis 24, Missouri

Why Risk Accidents with Your Industrial Trucks?

Plant accidents can cost you plenty. But *electric* industrial trucks can help eliminate the risk of three kinds of serious accidents—and save you money at the same time.

Fume free. Especially indoors, you must guard against air pollution. Fumes make personnel uncomfortable. And they can be fatal, even in low concentrations. But with electric industrial trucks you are free of this hazard. They're safe even in small rooms, in unventilated rooms, and in rooms with large numbers of people.

No fuel storage problem. You buy your electric power as you use it—from your local electric company—and at low rates that have been declining for years. Heavy duty storage batteries furnish dependable power throughout their long life. And you are relieved of the need to store liquid or gas fuel. Providing safe areas, handling the fuel daily to fill truck tanks—these difficulties are eliminated. And there's little danger of the truck itself catching on fire.

Cleaner floors. Your personnel are far safer against the danger of slipping on oil or grease spots. Electric industrial trucks have no messy crankcases—the battery power plant has no moving parts to lubricate. They run clean, keep your plant clean.

Why take chances? Besides increasing your plant safety, electric industrial trucks last longer, cost less to operate and less to maintain—savings that add up to an average of $1000 per year per truck.

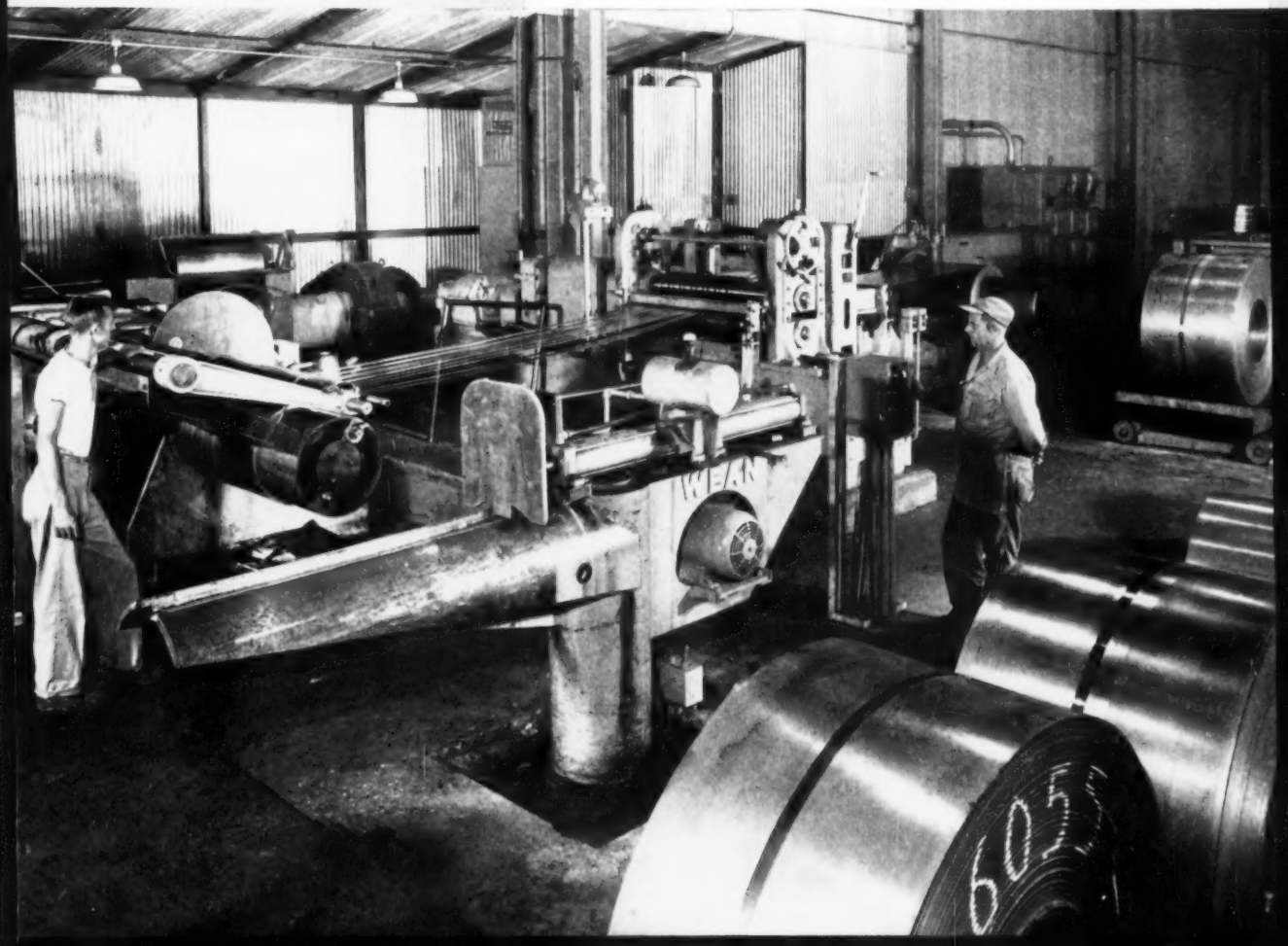
These are important considerations for up-to-date management men today. Have a talk with your nearby industrial truck dealer or salesman. He's listed in your classified telephone directory under "Trucks—industrial."

This message is presented as a service to industry by Exide Industrial Division, The Electric Storage Battery Company, Phila. 2, Pa.

THE ELECTRIC STORAGE BATTERY COMPANY **Exide**®

Slitting is faster, more accurate because of

WEAN CREATIVE ENGINEERING



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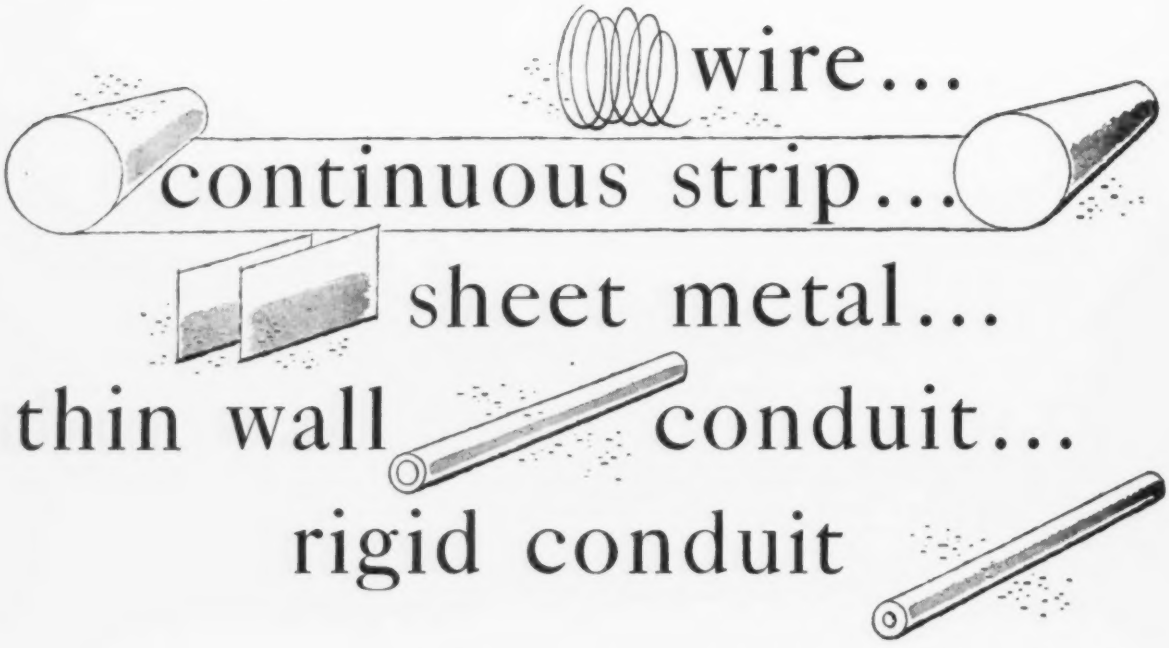
WEAN

● Wean high speed slitting lines are being used by more and more of the nation's steelmakers because they are engineered to perform the most accurate slitting job at cost reducing speeds. And, auxiliary coil handling equipment is designed to keep the steel moving — to get maximum production from the line at all times.

If slitting is part of your operation, get the last word on high production slitting from Wean engineers before you buy.

THE WEAN ENGINEERING COMPANY INC., WARREN, O.

IF YOU PROCESS...



YOU CAN *Automate* ALL THESE OPERATIONS:

- cleaning
- phosphating
- pickling
- scrubbing
- plating
- paint prep
- electrogalvanizing

For Faster, Better Production . . . At Far Less Cost
with an
H-VW-M CONTINUOUS LINE SYSTEM

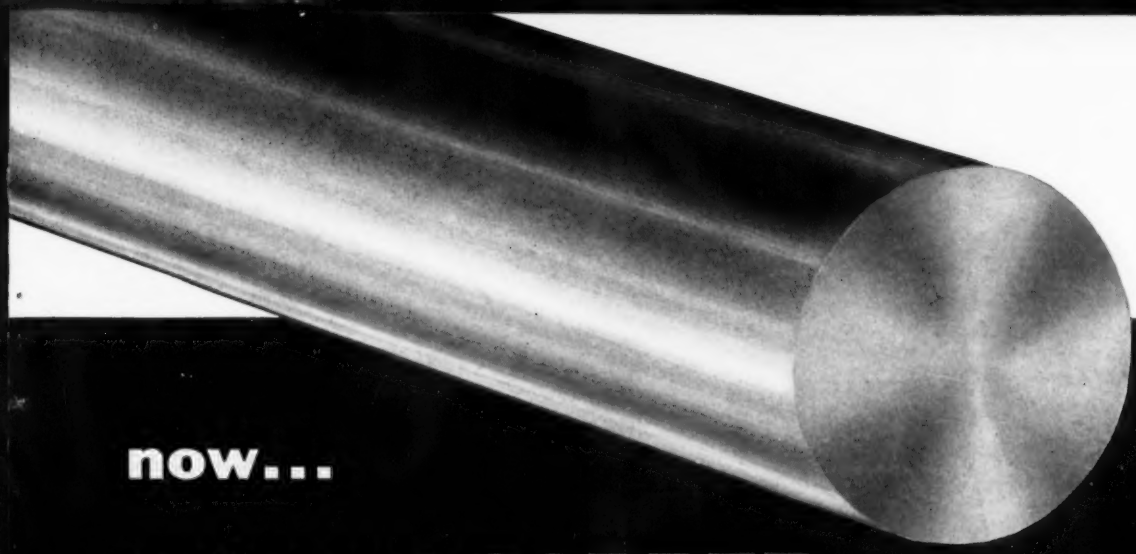
WRITE today, at no obligation, for the facts about an H-VW-M System that can bring cost-saving *automation* to your continuous line finishing—a system that can be integrated with your shearing, forming, slitting or annealing operations.

Hanson-Van Winkle-Munning Company, Matawan, New Jersey. Offices in principal cities

H-VW-M

Industry's Workshop for the Finest in Plating, Anodizing, and Polishing Processes • Equipment • Supplies

PLATEMANSHIP – Your H-VW-M combination—of the most modern testing and development laboratory—of over 80 years experience in every phase of plating and polishing – of a complete equipment, process and supply line for every need.



now...

we've put COPPER into STRESSPROOF® steel bars

and the pennies you save add up to dollars!

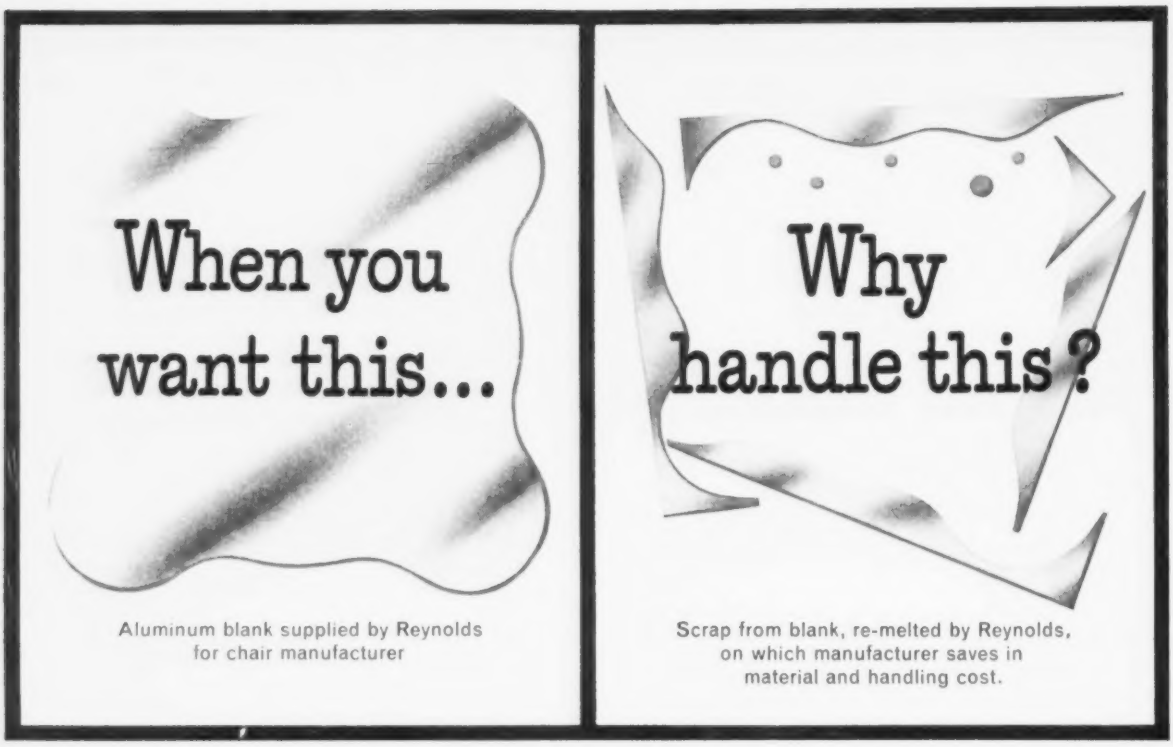
New Copper Controlled Chemistry improves machinability, gives added wear resistance, and resists corrosion

Production increases by as much as 15% to 50% have been achieved in customer tests comparing STRESSPROOF with and without copper.

The controlled addition of copper to the STRESSPROOF chemistry improves machinability, gives added wear resistance, and resists corrosion. In addition, yield strength is guaranteed . . . 100,000 p.s.i. in sizes through 2" and 90,000 p.s.i. in sizes over 2"—*and* STRESSPROOF requires no heat treating.

JUST PUBLISHED: A new engineering report, "The Effect of Copper, Abnormally Heavy Drafts, Furnace Treatment and Die Practice on STRESSPROOF Steel Bars." Copies are available on request.

La Salle STEEL CO.
1436 150th Street, Hammond, Indiana



Aluminum blank supplied by Reynolds for chair manufacturer

Scrap from blank, re-melted by Reynolds, on which manufacturer saves in material and handling cost.

Reynolds Aluminum Blanks Cut Scrap Loss and Handling

You can cut your scrap loss from punching, shearing and piercing operations as much as 30% if you use Blanks of Reynolds Aluminum. And not only do you save the loss on the scrap metal itself, but also the cost of handling and storing it.

Reynolds will supply aluminum blanks sheared, punched or pierced to your specifications; you get just the metal you use. Blanks from Reynolds can often save you press operations, too—as well as eliminate work stoppages, special operations and inventory problems. Cost control is simplified, too, when you don't have to contend with fluctuating scrap prices.

If you're looking for ways to cut costs—of materials, production, and handling—investigate the use of Reynolds Aluminum Blanks for your part or product. For information on blanks produced to your specifications, or completed parts or final assemblies, call your local Reynolds office, or write: *Reynolds Aluminum Fabricating Service, 2062 South Ninth Street, Louisville 1, Kentucky.*

Watch Reynolds All-Family Television Program "DISNEYLAND", ABC-TV.

The Finest Products Made with Aluminum are made with REYNOLDS ALUMINUM

REYNOLDS ALUMINUM
Fabricating Service

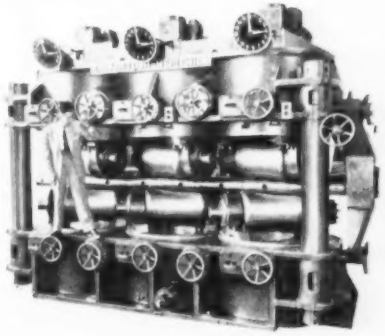
BLANKING • EMBOSSING • STAMPING
DRAWING • RIVETING • FORMING • WELDING
ROLL SHAPING • TUBE BENDING • BRAZING • FINISHING

...ALL SIZES STRAIGHTENED AND PERFECTLY ROUNDED ON MACK-HEMP ROTARY TUBE STRAIGHTENERS

Tubes of any alloy in any O.D. from .050-inch to 16 inches are production straightened and rounded at speeds up to 800 feet per minute or better. The six driven rolls are fully adjustable to suit tube diameter, amount of straightening bend needed, and correct contact grip on the tube. The machine operates without speed-limiting, surface-marring guides and the finished tubing shows no spiral markings.

All models—from the smallest to the largest—are now available in Mack-Hemp's exclusive new three-post construction.

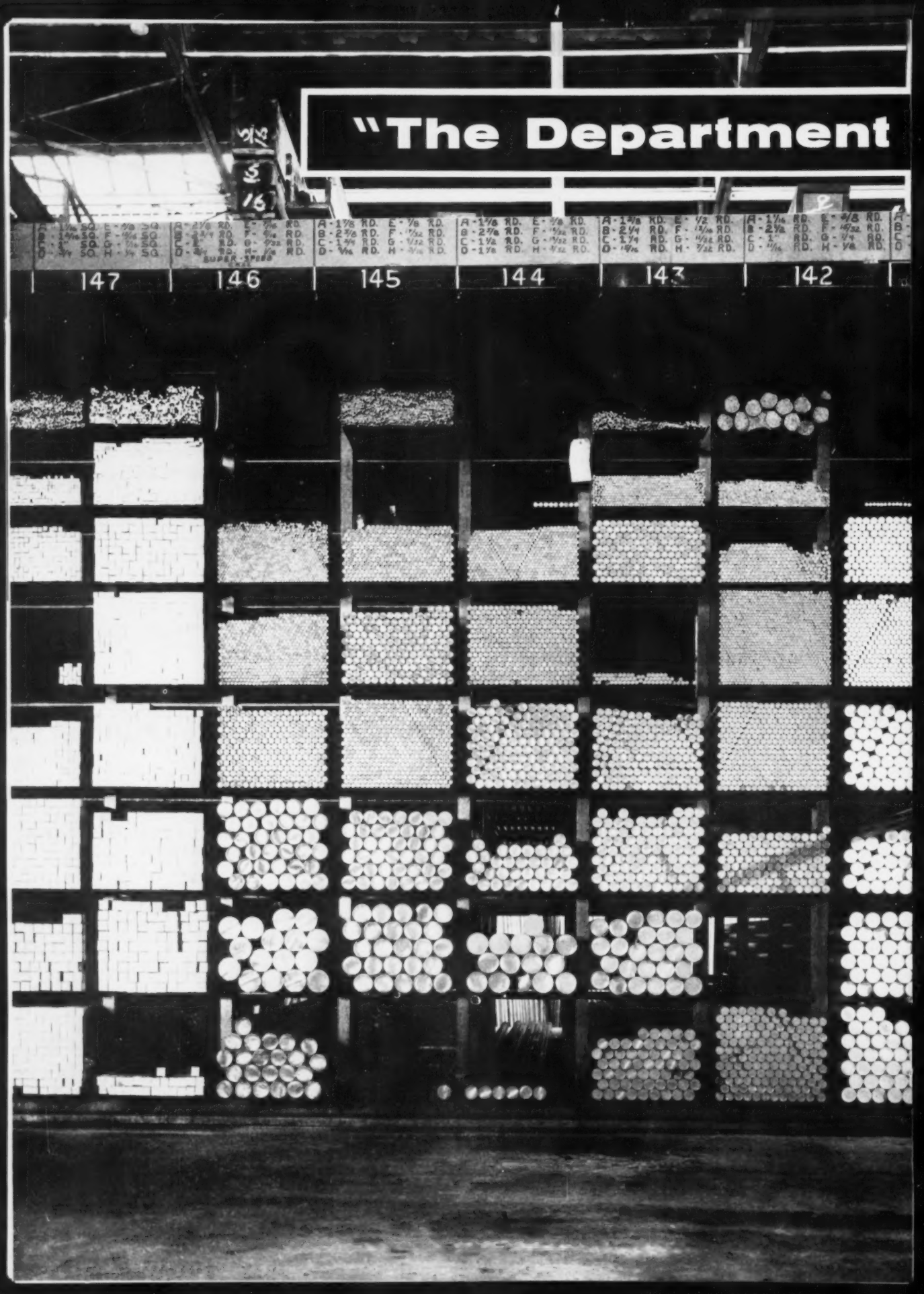
For complete details of Mack-Hemp straighteners, write today for a free copy of our 24-page Technical Bulletin No. 55-A, "How to Straighten Pipe and Tube".



MACKINTOSH-HEMPHILL Division of E. W. BLISS Company

901 Bingham Street, Pittsburgh 3, Pa.

Makers of the rolls with the Striped Red Wabblers


"The Department
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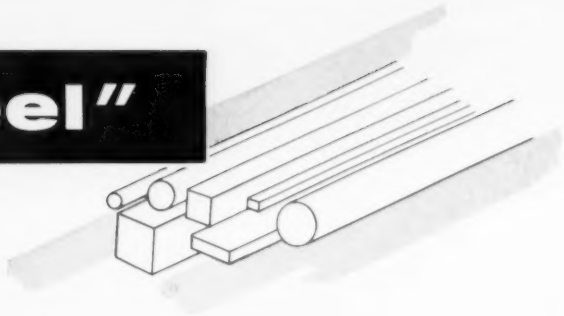
Store of Steel"



One piece or a truckload . . . we've got it!

Call your J & L Steel Warehouse . . . your "Department Store of Steel". . . for prompt delivery of your next cold-finished steel order.

Use our widely diversified range of sizes and analyses as your inventory. Give us a call on your next steel order . . . make your J & L Steel Warehouse your "Department Store of Steel."

J & L Steel Warehouse Division

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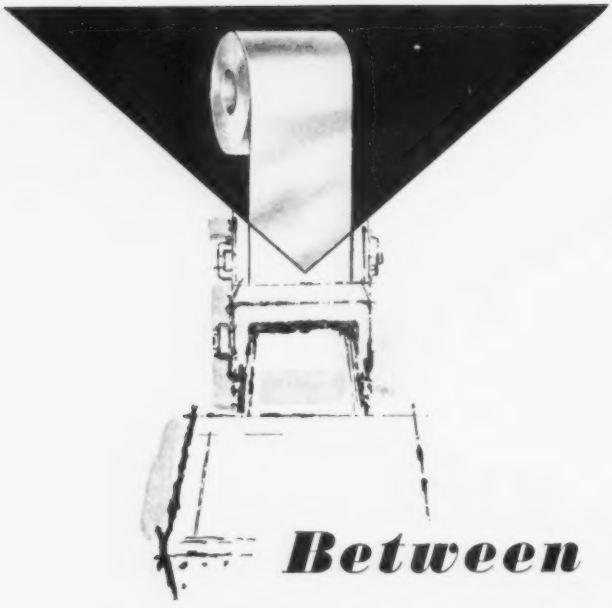
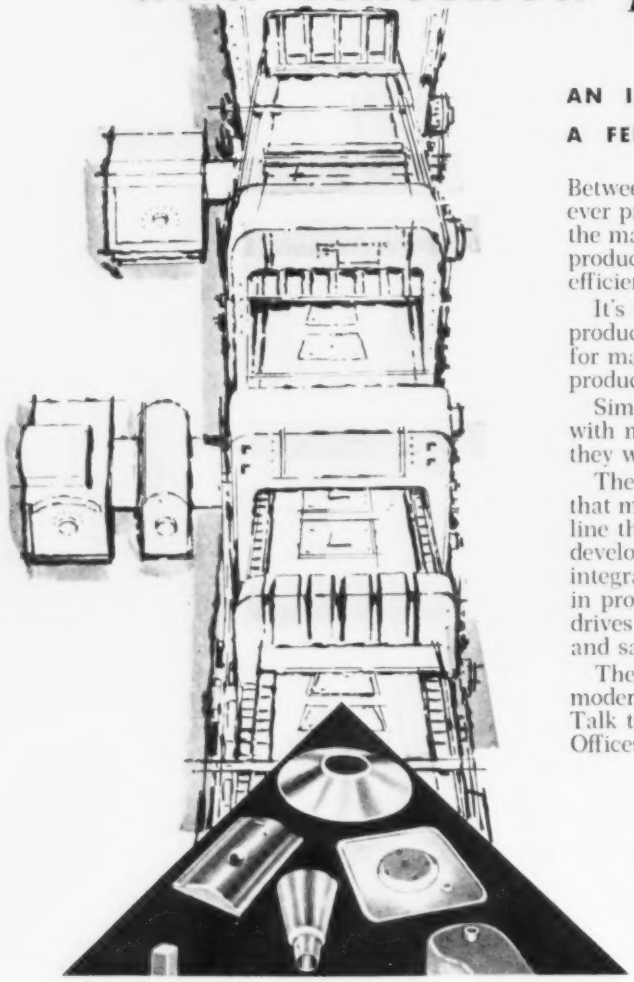
CHICAGO · CINCINNATI · CLEVELAND · DETROIT · HAMMOND · INDIANAPOLIS · LANCASTER
LOUISVILLE · MEMPHIS · NASHVILLE · NEW ORLEANS · NEW YORK · PITTSBURGH

FIND US FAST IN THE YELLOW PAGES



Between material and finished part . . .



AN IDEA THAT MAKES SENSE —
A FEDERAL-WARCO PRODUCTION LINE

Between material and finished part is the ever present problem of bringing together the machinery necessary to perform all production on operations as speedily and efficiently as possible.

It's here, the Federal-Warco, this packaged production line has proved to be the answer for many of the nation's foremost production experts.

Simply provide Federal-Warco engineers with material and part information and they will develop a line to do the job.

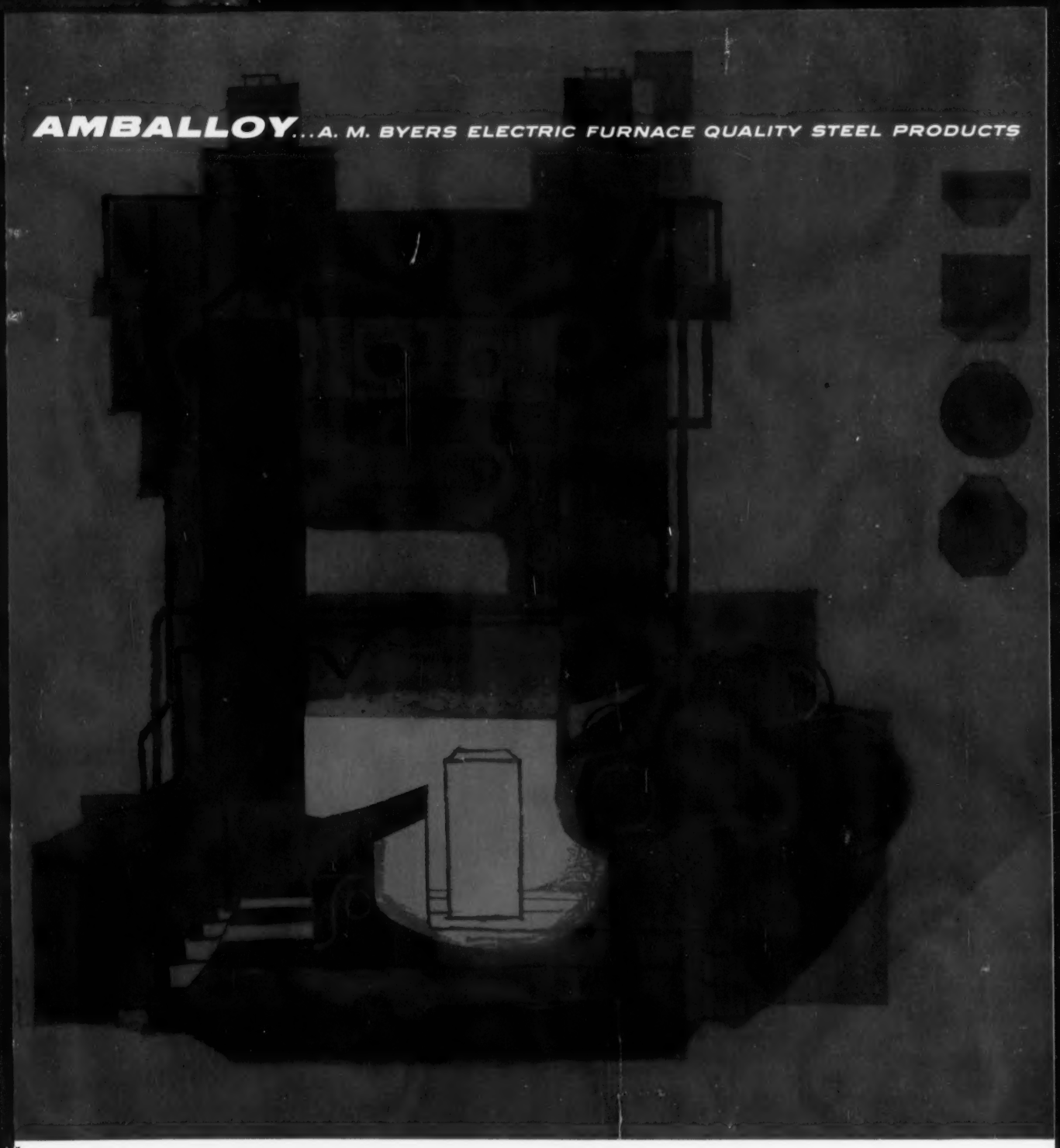
The advantages: One source responsibility that means faster, more thorough service; a line that is 100% harmonic, all stations developed especially to work in synchronization; integrated and automated handling of work in process; the possibility of utilizing common drives and bases, reducing operating costs and saving valuable floor space.

There is much more. Why not look into this modern method of production line manufacture? Talk to your Federal-Warco representative. Offices in all leading industrial areas.

Federal / Warco
PACKAGED
PRODUCTION LINES

423 THE FEDERAL MACHINE AND WELDER COMPANY • WARREN, OHIO

AMBALLOY...A. M. BYERS ELECTRIC FURNACE QUALITY STEEL PRODUCTS



FROM HIGH-GRADE CONVERSION FACILITIES... BETTER END PRODUCTS

The consistent quality of AMBALLOY steels—stainless, alloy and carbon—is rooted in the exacting quality control of our high-grade conversion facilities. The detailed attention we give to every step of the conversion process means better end products for users of Amballoy specialty steels.

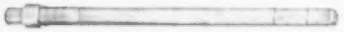
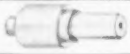
Important too, is the fact that our facilities are available for your conversion needs. We'd like to discuss with you the advantages of using our special processing operations.

And to provide you with helpful solutions to your material selection problems, Byers offers a staff of highly trained metallurgists. We can serve you with knowledge and facilities that put your order where you want it, when you want it. Check Byers first. Write or call for details. A. M. Byers Company, Clark Building, Pittsburgh 22, Pa.

A growth company with the emphasis on quality and service **A. M. BYERS COMPANY**

10 JOBS ANALYZED

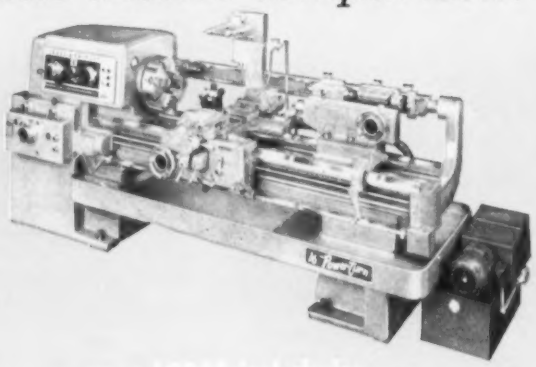
...important savings obtained on every one with new Lodge & Shipley Powerturn Copymatic lathe

Workpiece	Pieces in lot	Set-up hours	Machine hours	Total hours	Time/part minutes	TIME SAVED	Machine used
	48	2.1	6.2	8.3	10.3		automatic lathe
	60	0.9	3.6	4.5	4.5	56%	Powerturn Copymatic
	18	1.0	1.9	2.9	9.6		automatic lathe
	20	0.6	1.1	1.7	5.1	47%	Powerturn Copymatic
	30	2.7	9.1	11.8	23.6		automatic lathe
	40	1.7	6.8	8.5	12.7	47%	Powerturn Copymatic
	40	1.9	9.6	11.5	17.2		automatic lathe
	60	2.3	12.4	14.7	14.7	14%	Powerturn Copymatic
	20	0.4	0.9	1.3	3.9		automatic lathe
	20	0.3	0.3	0.6	1.8	53%	Powerturn Copymatic
	40	2.9	6.8	9.7	14.5		automatic lathe
	60	0.7	5.3	6.0	6.0	59%	Powerturn Copymatic
	20	2.5	3.4	5.9	17.7		automatic lathe
	29	0.5	3.1	3.6	7.4	59%	Powerturn Copymatic
	40	2.8	6.7	9.5	14.2		automatic lathe
	60	1.3	6.5	7.8	7.6	46%	Powerturn Copymatic
	40	1.5	6.6	8.1	12.1		automatic lathe
	30	1.3	3.2	3.5	7.0	42%	Powerturn Copymatic
	50	2.1	6.6	8.7	10.4		automatic lathe
	50	1.6	4.6	6.2	7.4	29%	Powerturn Copymatic

...the Powerturn Copymatic invites comparison!

A well-known machine tool manufacturer kept records on Powerturn Copymatic production compared to previously used automatic lathes . . . On the ten jobs recorded, savings in time alone range up to 59%! Average time savings were better than 45%! Note that set-up time (lower in every case) was included.

Virtually every Lodge & Shipley Copymatic installation has resulted in significant savings. Your Lodge & Shipley distributor will gladly help you investigate Powerturn Copymatic possibilities in your plant or write direct for additional case history data. **The Lodge & Shipley Co., 3055 Colerain Ave., Cincinnati 25, Ohio.**



your LOOK-fast choice...

Lodge & Shipley

Roebling Royal Blue Wire Rope will take **shock** after **shock** after **shock!**

This, and the fact that Royal Blue is stronger than the strongest you have been using, has helped to make it the most widely favored rope in Roebling's history. It will work hard and last longer on *your* job. Your distributor or Roebling Sales Office will give you full information, or write: John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING

Distributors, Branches and Warehouses Throughout the Country
Subsidiary of The Colorado Fuel and Iron Corporation

"We switched over to Columbia-so far we've saved $2,100

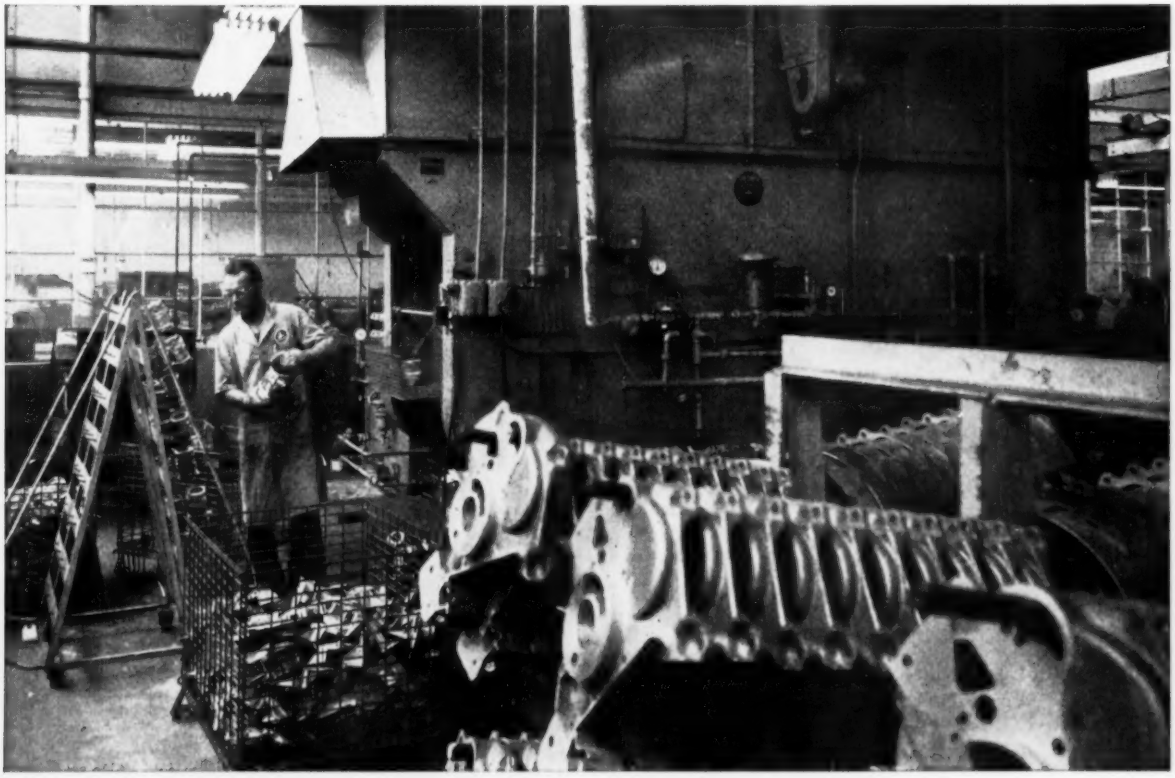
says Mr. Bernard Rosebrough
Plant Engineering Project Coordinator
McCulloch Motors Corporation
Los Angeles 45, California

"We'd tried four other degreasing solvents, so I have a real basis for comparison. For example, in the 22 weeks since putting in Columbia-Southern Trichlorethylene, we've cleaned out each of our six units just once. With all the other solvents used, our degreasers needed cleanout and fresh solvent every three weeks. We now make one changeover, instead of eight for the same period. Our net savings on man-hours for maintenance alone, without counting loss of production, adds up to $2,100.

"Here's the plant, at 6101 West Century Boulevard. We produce our own line of McCulloch Chain Saws, Scott-Atwater Outboard Motors, Superchargers for custom cars, and four-cylinder drone engines for military target ships.

"This is the Model 55, one of our most popular chain saws. We run magnesium, aluminum and steel parts through the degreasers in producing all of our saws and other products. That's one reason why we insist on high solvent uniformity and purity.

Southern Trichlor 22 weeks ago—just on maintenance alone!"



"Here's the 'big boy' of our six degreasing units. It's part of our sub-assembly operation. You can imagine what happens to production when it's shut down for cleanout. Figure two men for 16 hours to do a complete drain, clean, refill—see why I like a solvent that keeps a degreaser like this in action? Another big point. A year ago we had a fire in this unit that caused more than $6,000 damage. We believe that Columbia-Southern Trichlorethylene's stability makes it a safer solvent, and reduces fire hazard to a minimum.

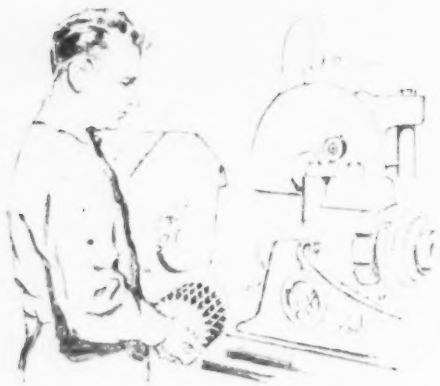
"Look like I'm sold on one particular solvent? Well, how about this: Columbia-Southern's Trichlor lets us operate our units ten degrees higher than we felt safe in going with any other solvent tested here. You know what this means: more contaminant saturation, faster cleaning, less solvent used. And I like the dependable delivery and good servicing the jobber and Columbia-Southern's District Sales Office provide."

For more information, contact our Pittsburgh address or any of the fourteen Columbia-Southern District Sales Offices

COLUMBIA-SOUTHERN CHEMICAL CORPORATION
SUBSIDIARY OF PITTSBURGH PLATE GLASS COMPANY
ONE GATEWAY CENTER · PITTSBURGH 22 · PENNSYLVANIA

DISTRICT OFFICES: Cincinnati • Charlotte • Chicago • Cleveland • Boston New York • St. Louis • Minneapolis New Orleans • Dallas • Houston Pittsburgh • Philadelphia • San Francisco

IN CANADA: Standard Chemical Limited and its Commercial Chemicals Division



Before joining Bay State ex-Marine Ben Guy learned trouble-shooting the hard way. He steers clear of guesswork, digs for facts and analyzes them to come up with answers that really work.

He upped crush-form grinding efficiency 500% for Western Gear Works

Western Gear Works, of Belmont, Cal., had the kind of trouble that could put a good production man on tranquilizers. In their crush-form grinding operation, so many gears had to be junked because of heat checks that total saleable production was only 9 good gears a day.

Bay State sales engineer Ben Guy was called in and diagnosed the trouble as soon as he got the specification of the wheel they'd been using. After making minor adjustments to the machine, he specified a Bay State wheel that ran cooler and cut cleaner. Result: production zoomed 500% to 45 good gears every 8 hours. Heat checks and loss of tolerance were totally eliminated.

Bay State representatives don't solve all their customers' problems as easily as this, of course, but the Western Gear story shows how important it is to have an abrasive man on tap who really knows his business. If you want careful, cost-conscious recommendations on your grinding problems, you'll find the Bay State man in your area has been thoroughly trained to give you that . . . and more.

BAY STATE ABRASIVES

BAY STATE WHEELS of PROGRESS

Bay State Abrasive Products Co., Westboro, Massachusetts.
Branch Offices and Warehouses: Bristol, Conn., Chicago, Cleveland, Detroit, Pittsburgh. *Distributors:* All principal cities. Bay State Abrasive Products Co. (Canada) Ltd., Brantford, Ontario.

Exclusive with the Heroult:

100% Mechanical Operation

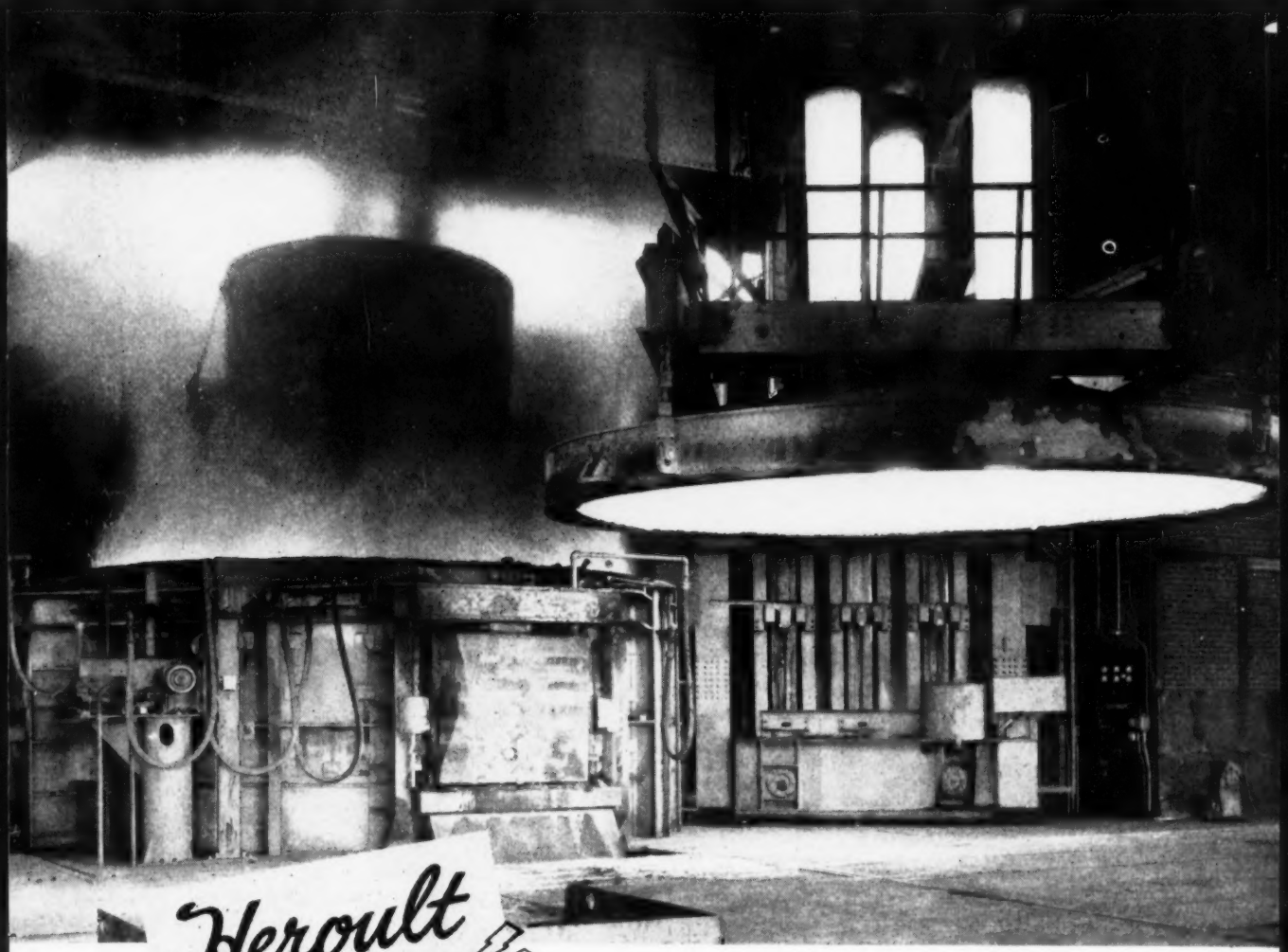
The Heroult is the *only* 100% mechanically operated electric furnace on the market! All of the movements are handled by motor-driven gear mechanism.

This is a very important advantage—as any engineer will readily tell you, for it eliminates so many maintenance difficulties.

There is nothing about the operation and servicing of the motor-driven, heavy-gear mechanism of the rugged Heroult that any good maintenance man can't easily take care of himself. Seldom, if ever, will you find it necessary to call in an outside maintenance man to keep your Heroult performing efficiently.

Modern Heroult electric furnaces are available in sizes ranging in holding capacity from 6,000 lbs. up to and in excess of 400,000 lbs. Both gantry and swing-type roof-moving mechanisms are available. Door-charging furnaces and furnaces of special design, including units equipped with austenitic steel bottoms to permit induction stirring, can also be supplied.

We welcome an opportunity to help you select and install the Heroult best suited to your requirements. An inquiry to the nearest office will bring complete details.



Heroult

ELECTRIC MELTING FURNACES

USS

AMERICAN BRIDGE DIVISION

UNITED STATES STEEL CORPORATION, GENERAL OFFICES: 525 WILLIAM PENN PLACE, PITTSBURGH, PA.

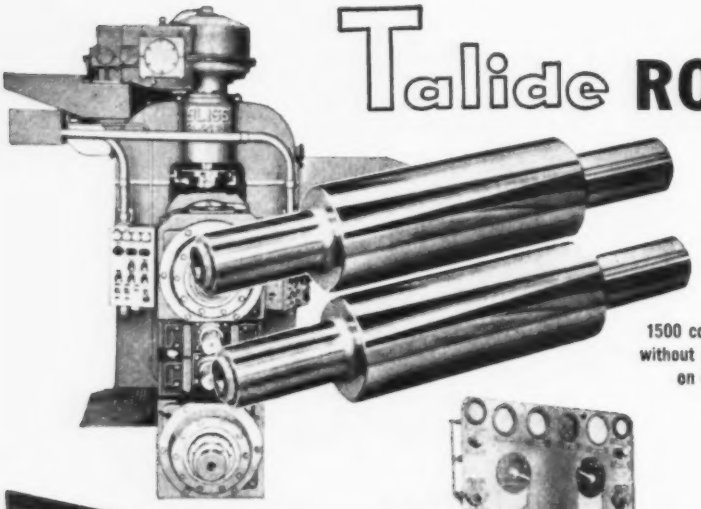
Contracting Offices in New York, Philadelphia, Chicago, San Francisco, and other principal cities.

United States Steel Export Company, New York

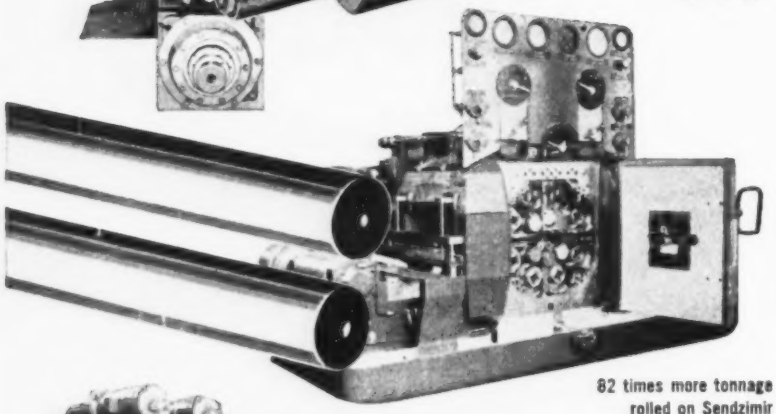
SEE THE UNITED STATES STEEL HOUR. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

UNITED STATES STEEL

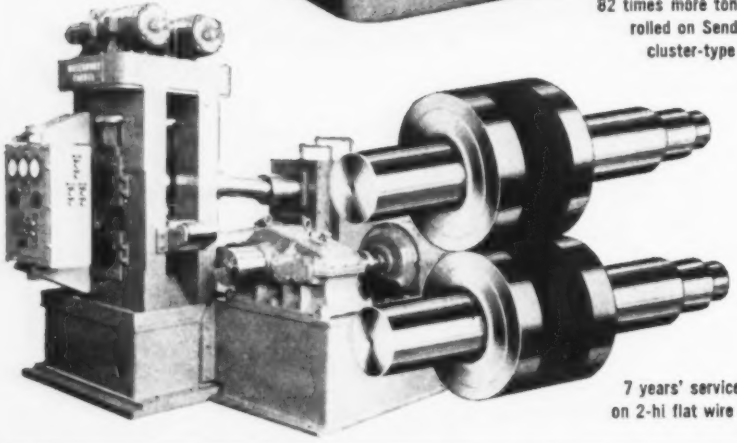
Talide ROLLS OUTLAST ALL OTHERS!



1500 coils rolled without a regrind on 4-hi mill.



82 times more tonnage rolled on Sendzimir cluster-type mill.



7 years' service life on 2-hi flat wire mill.

Talide rolls have proven far superior to both steel rolls and carbide rolls of any other make.

During the last five years Talide rolls have been adopted by every major strip steel producer. Metal Carbides pioneered and developed tungsten carbide rolls and successfully adapted them to all types of rolling mills including STECKEL, BLISS, UNITED, MESTA, STANAT, SENDZIMIR, WATERBURY-FARREL, TORRINGTON, RUESCH, FENN, WEAN, COLD METAL, etc.

Talide work rolls are ultra-hard, extremely dense and porous-free. Manufactured from highest purity tungsten carbide powders, the surface finish of a Talide roll is smoother than one microinch. Hard as a diamond, it will take a "bigger bite" than a steel roll. Strip steel of all analyses can be rolled down to thinner gauge, with more accuracy, greater reductions and with fewer anneals than possible with any other roll.

ONLY TALIDE WORK ROLLS GUARANTEE THESE ADVANTAGES

- ★ MORE PRODUCTION
- ★ BETTER FINISH
- ★ LONGER LIFE
- ★ HIGHER SPEEDS
- ★ CLOSER TOLERANCE
- ★ IMPROVED PHYSICALS
- ★ GREATER REDUCTION
- ★ LESS DOWN TIME
- ★ FEWER REJECTS
- ★ LESS MAINTENANCE

EXCLUSIVE REPAIR SERVICE

Broken or damaged carbide rolls can be re-worked to first class condition with all defects eliminated at one-half original cost. Only Metal Carbides offers this service—because of its exclusive hot press method.

Talide Rolls are made in lengths up to 100", diameters up to 25", and up to 5000 lbs. by weight.

Metal Carbides Corporation,
Youngstown 12, Ohio.

Send for new 76-page catalog 56-G

SUPERSET GRINDING WHEEL

The Superset diamond grinding wheel was specially developed for grinding carbide rolls to highest possible surface finish and luster. Made of 4-8 micron size diamond dust, it imparts a surface finish far superior to any other commercial wheel. Available in sizes up to 25" diameter

METAL CARBIDES CORPORATION
TALIDE®
YOUNGSTOWN 12, OHIO
HOT PRESSED AND SINTERED CARBIDES • VACUUM METALS
HEAVY METAL • ALUMINUM OXIDE • HI-TEMP. ALLOYS
OVER 25 YEARS' EXPERIENCE IN TUNGSTEN CARBIDE METALLURGY

John Carroll University specifies

Youngstown **S**teel **P**ipe for new Campus Service Building

This attractive new Service Building, parts of which are now under construction on the campus of Cleveland's John Carroll University, will contain a Gymnasium, Transportation Hall, Student Activities Center and a Student Dining Hall. To coordinate all the structure's physical functions, the University and its architect specified Youngstown Steel Pipe for its dependability and long life.

Youngstown Steel Pipe is made of only the highest quality steel by steelmen with over 56 years of pipemaking experience. All of Youngstown's fully integrated operations—from iron ore mining to finish pipe threading—are rigidly quality-controlled to provide the best steel pipe available anywhere. Why not make Youngstown your continuing specification for long life and trouble-free installations?

For additional information or service, call your local Youngstown distributor—or contact our nearest District Sales Office, today.

THE YOUNGSTOWN SHEET AND TUBE COMPANY
Manufacturers of Carbon, Alloy and Yoloy Steel
General Offices - Youngstown 1, Ohio
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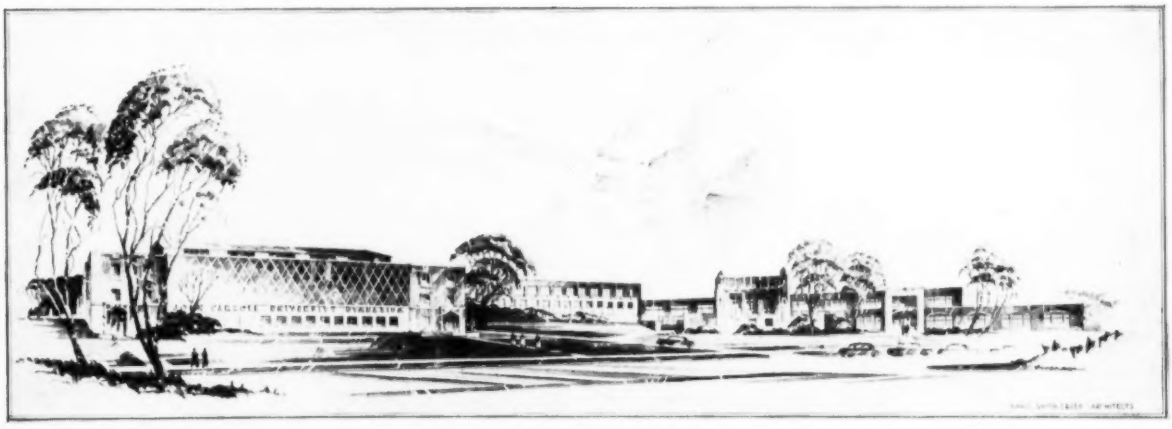
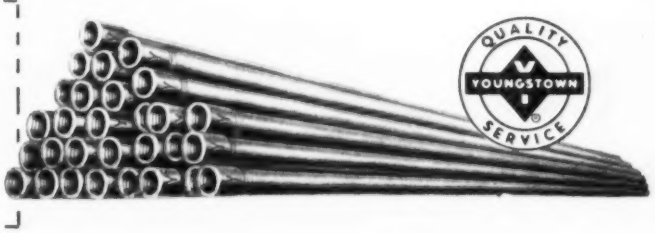
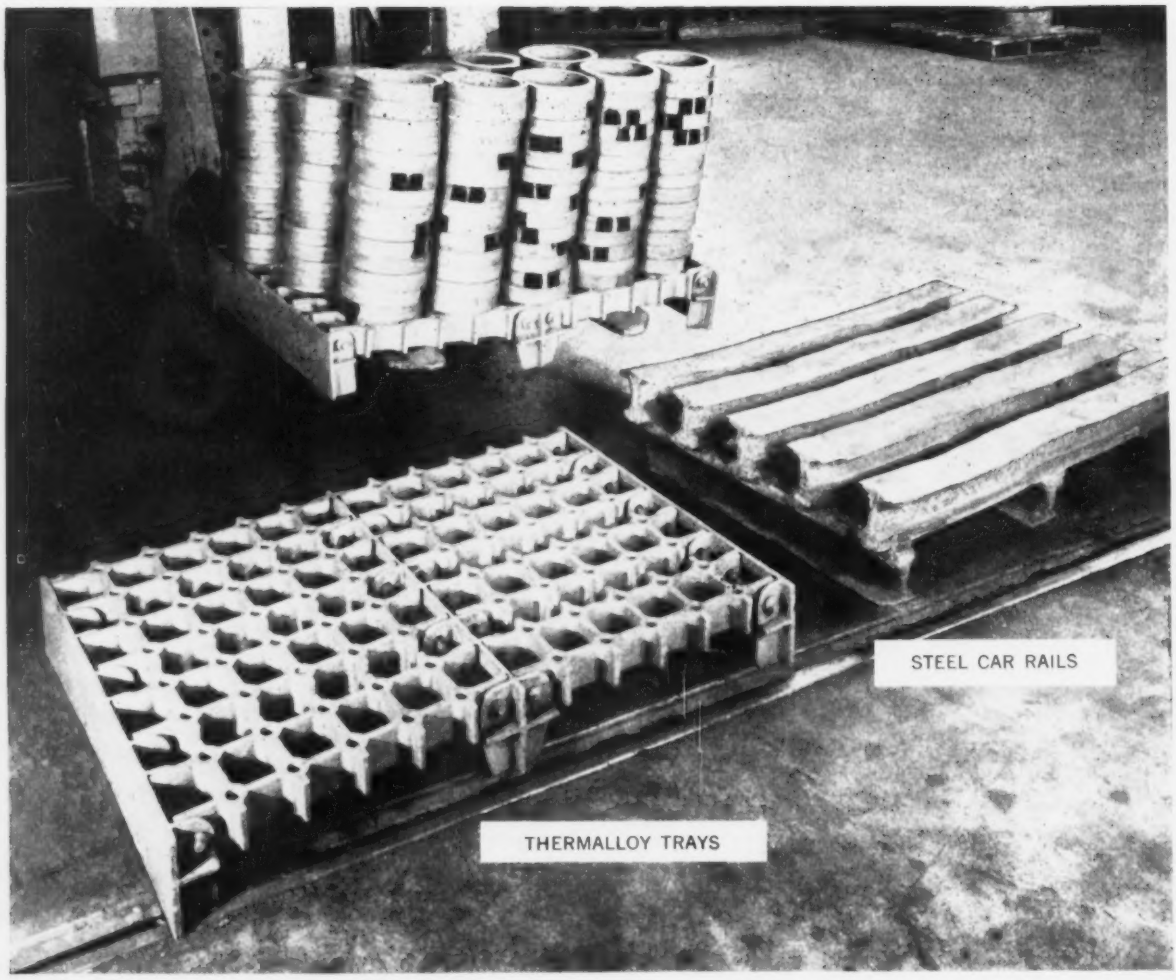
John Carroll University Service Building
Architect: Small, Smith, Reeb and Draz, Cleveland
General Contractor: Roediger Construction Inc., Cleveland
Plumbing & Heating Contractor:
The Gorman-Lavelle Plumbing & Heating Co., Cleveland
Distributor: Grinnell Company, Cleveland



Specify Youngstown and secure these 7 Points of uniform goodness

uniform ductility
uniform lengths
uniform threading
uniform weldability
uniform roundness and straightness
uniform wall thickness and size
uniform strength and toughness





Thermalloy* Heat-Resistant Trays Cut Costs for SKF Industries

At SKF Industries in Philadelphia, steel forgings are annealed in a car-type furnace at temperatures between 1450 and 1650 degrees F. Steel car rails were used to support the forgings in the furnace. But these warped and scaled after short service and became useless.

At the same time, SKF tried the specially designed trays of Thermalloy "30" shown above. These trays have given *six times the service life* obtained from the rails — and are still in use, with many more months of service left. In a cost comparison with the steel rails, SKF found that the Thermalloy trays were less expensive, considering *only* their service life to date.

Thermalloy heat-resistant alloys and Electro-Alloys' design know-how are providing longer service life in scores of heat-treat applications and are saving money for users.

Whatever your heat-treat problem, it pays to contact Electro-Alloys. For further technical information on Thermalloy trays and fixtures, call your nearby Electro-Alloys representative or write for Bulletin T-227. Electro-Alloys Division, 3019 Taylor St., Elyria, Ohio.

*Reg. U. S. Pat. Off.

AMERICAN Brake Shoe COMPANY

ELECTRO-ALLOYS DIVISION Elyria, Ohio

Quality in Ascendancy

The superiority of the vast number of products that are—and can be made from Roebling Cold Rolled Flat Spring Steel is a fact known throughout all industry.

You pay for mechanical and dimensional uniformity when you buy flat spring steel...you *get* it when you buy Roebling.

For information on how our products can help *yours*, write Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING

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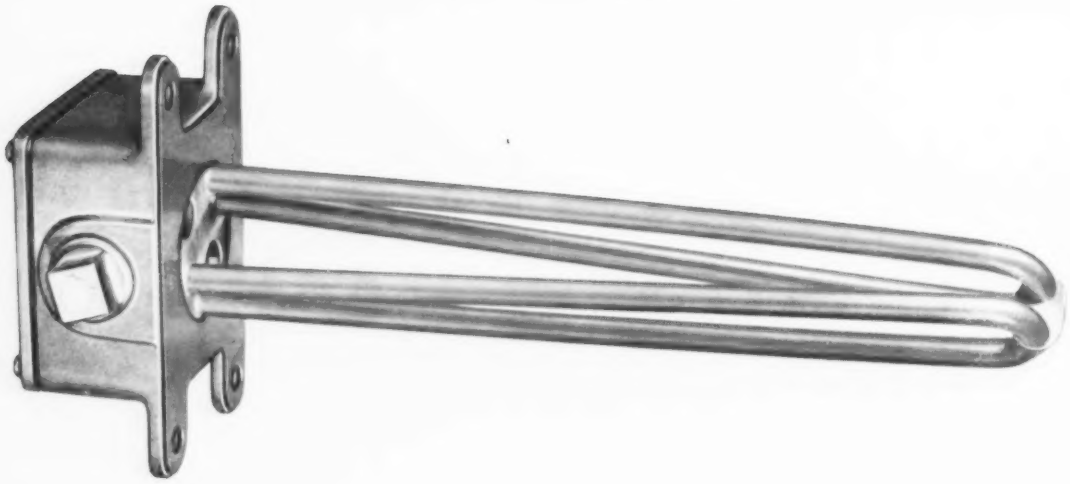
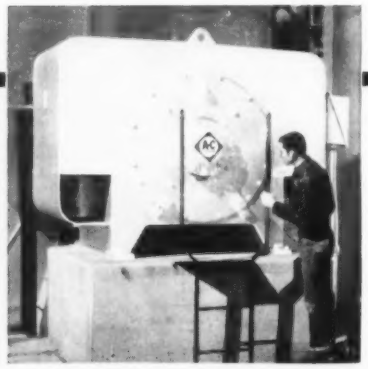
Roebling... Your Product is Better for it

One of many reasons why **ALLIS-CHALMERS MOTORS** are preferred for outdoor applications in the

METAL WORKING INDUSTRY





Weather-protected motor in outdoor service.

Space Heater is weather protected

(and corrosion-proof!)

Weather-protected heaters are standard on Allis-Chalmers outdoor motors . . . prevent moisture condensation on motor parts during shutdown periods. These immersion-type heaters are not only water-proof, they are also stainless steel clad for resistance to corrosion.

Easy Maintenance, too!

Heater terminal box mounts outside motor frame; heating element projects into motor enclosure. Open wiring inside motor is eliminated. Entire heating unit is easily removed for service or replacement.

For details on this and all the other outstanding features of Allis-Chalmers motors, call your nearby A-C office or write Allis-Chalmers, Power Equipment Division, Milwauke 1, Wisconsin.

A-C ALLIS-CHALMERS

A-5490

Deep Drawing in One Pass

Modulator covers for airborne electronic equipment are being deep drawn from flat magnesium sheet in one press stroke. It's done without necessity for staging dies and intermediate anneals. The drawn magnesium cover is arc welded to a magnesium casting, resulting in a minimum of production operations.

Need Hot Air?

A railroad equipment maker is developing a heater capable of volume delivery of air superheated to 1000°F. A steel mill is already using one unit to heat the air which carries powdered coal to a combustion chamber. Other possible uses include: thawing hopper car loads (especially where hot water or steam would affect car contents); heating the air stream in virtually any air-injection fuel nozzle to improve combustion.

Commies Hunt Copper

Red China has sent four men to Chile in an attempt to get much needed copper ingots, bars and major mill products from the Chileans. And Chile is sorely tempted to sell, despite her international agreement not to. The Chilean economy depends on copper, and current surpluses are really hurting. A sale of the surplus at the right price would help clear her economic atmosphere.

Seaway Offers Savings

Shipping from the midwest out through the St. Lawrence Seaway continues to forge ahead on its money-saving impetus. One Ohio firm even schedules overtime to make up enough units for shipment on outgoing vessels. Its freight savings are 25 pct, mostly because handlings are cut from seven (when rail freight is used through to New York) to just two when products go direct from Toledo by boat.

Raise Heat Barriers

Nickel-base, silver-impregnated materials said to have superior extreme-temperature characteristics have been developed for the Air Force. They're intended for use in jet engine bearing cages, and should increase engine efficiency and power. Best of the new lot is said to be a seven per cent chromium boride compound added to a silver-infiltrated nickel matrix produced by powder metallurgy.

Stainless Dip This Quarter

Stainless producers are revising their fourth quarter estimates downward. It looks now as though the final three months will be well below the level attained in the first quarter. However, shipments for the year as a whole are expected to be about equal to the 1956 figure of 688,000 tons.

High-Speed Screwdriver

Automatic assembly is moving into the big time with the advent of a machine that automatically feeds and drives standard socket set screws at rates up to 1800 an hour. It handles either hex or multiple spline socket types, and with any of the standard points. Diameters down to No. 2 wire size and up to 5/8 in. can be driven. The unit even accommodates screws with lengths shorter than their diameters.

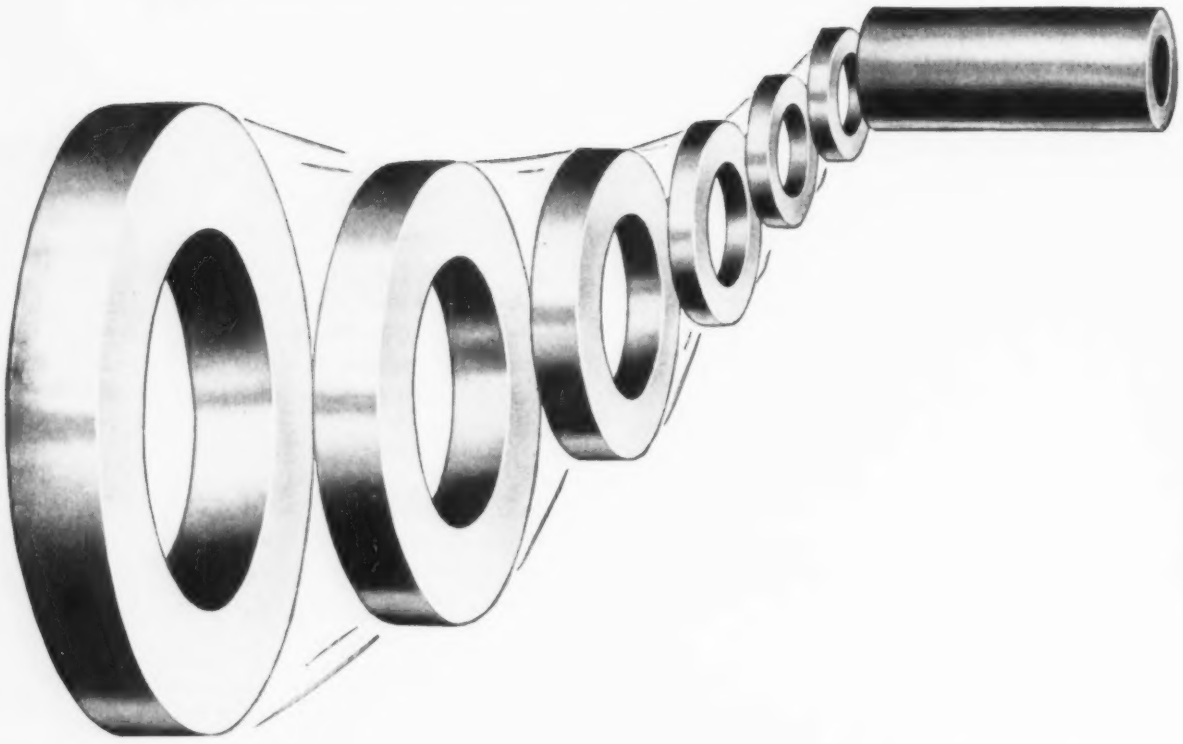
Want Missile Business?

Firms who can machine missile hardware should be in great demand for some years to come. If you have modern, tracer-controlled equipment, know how to best use carbides and ceramics on alloys hardened to Rc 55 or so, and can work to tolerances in "tenths," go call on a few prime contractors. If you can really do the work you stand an excellent chance of getting a steady flow of business.

King-Size Heat Pump

A quarter-million cubic feet of winter air per minute will be warmed by a heat pump at one new manufacturing facility in the Chicago suburbs. Reversed in summer, the unit will cool all factory and office areas of the 220,000 sq ft plant. It will be the largest of its type in the country, and points up the growing use of such equipment for industrial buildings as well as homes.

How to add machining capacity without adding machines



...and save money on your steel!

ARE you making hollow parts, or boring out solid bar stock? Timken® seamless steel tubing can eliminate that unnecessary and costly boring operation—because Timken seamless steel tubing comes with *the hole already there.*

By cutting out this needless operation, you free screw machine stations for other jobs. You get increased machining capacity without adding machines. More than that, you pay only for the steel you use—without wasting solid bar stock centers. And of course you speed up your hollow part operation by starting with Timken seamless steel tubing; *finish* boring can become your first production step.

Timken seamless steel tubing is made by a piercing process which is basically a forging operation. So you get fine forged quality: uniform spiral grain flow for greater strength, and refined grain structure. This quality is maintained from heat to heat, tube to tube and order to order. The Timken seamless steel tubing recommended by our engineers as *your* most economical tube size will be guaranteed to clean up to your finished dimensions.

The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

TIMKEN *Fine Alloy* **STEEL**

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS STEEL TUBING

Purchasing Agents Sound Off on Inventories:

Appliance Maker:
"... on our way to a five-year low"

Heavy Equipment Manufacturer:
"... 10-15 pct below a year ago ... business up, buying down"

Electronic Equipment Producer:
"... at half the raw steel inventory of a year ago ..."

Equipment Maker:
"... traveling on thin ice ..."

Railroad car builder:
"... On plate, frankly, we're still in trouble."

Machinery Builder:
"... lowest point since Korea."

Auto Parts Maker:
"... roughly 10 pct higher than a year ago."

Packaging Producer:
"... It's the same story: Inventory reduction!"

Purchasing Agents Are Playing It Close to the Vest

Inventory cutbacks continue. But buyers admit they may be skating on thin ice.

Cost-consciousness and tight money have important bearing on inventory policies.

"We're living dangerously," says a major appliance manufacturer.—By K. W. Bennett.

▪ What happened to the post-Labor Day upturn? It's coming, but like the seven-year itch, it is uncomfortably slow in reaching the crisis stage.

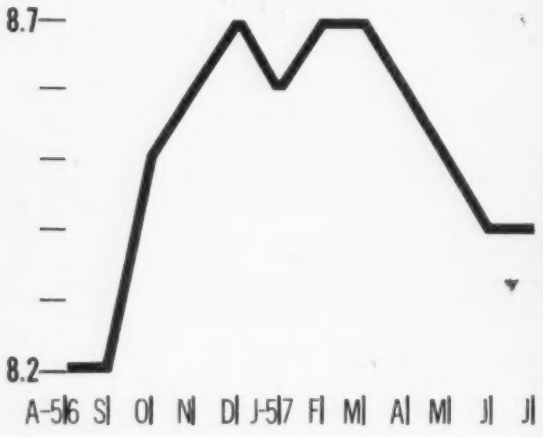
A panel of steel buyers, chosen from 18 important metal-working firms, feels this way about it:

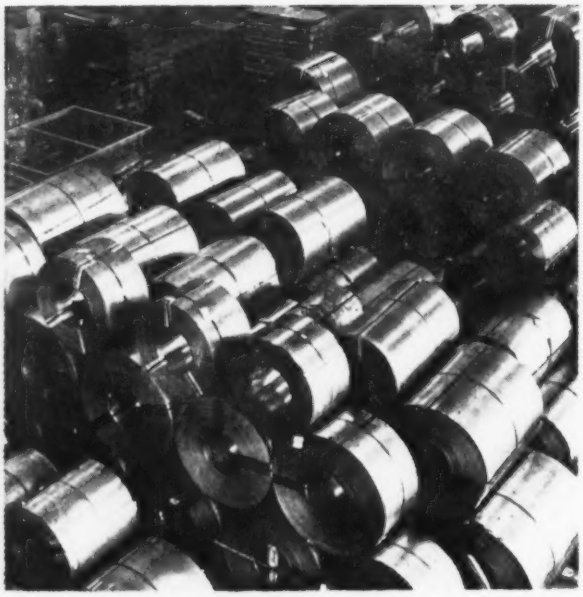
Inventories Down—Nobody has much inventory. But a surprising number of major firms are still reducing steel inventories. Everybody is skating on thin inventory ice. Reserves of steel in customer warehouse bays are low. But the reduction continues.

Sensitive Balance — Where inventories exist, they are based on quick mill delivery of steel, and low sales forecasts for the steel

Inventories Are Down—But Still High

Purchased Materials, Durable Goods Industries Seasonally adjusted in millions of dollars.





consumers' own products. A stretchout in mill deliveries or a sharp upturn in general business levels will be reflected quickly in sharp advances in customer buying rates.

Cutbacks Continue—The general inventory reduction that began in February is still going on. It's continuing even though the steel consumer's own business levels have advanced or are beginning to advance. One appliance producer is manufacturing major appliances at about one-half the rate his dealers are selling them. Despite this, he'll continue to reduce steel inventory through the remainder of the year.

Economy Drive—U. S. industrial plants this year began one of the stiffest inventory control programs in the nation's history. It rivals the cutbacks of 1954. The extent of the cutback has little bearing on the steel user's own business. The object: Reduced inventory costs, reduction of capital tied up in inventory. It stems more often from top management thinking than it does from purchasing agent thinking.

Historically, August steel sales activity should have advanced about 9 pct over the July figure. Mill business advanced about 3 pct. Historically, September mill ingot tonnages should have advanced about 5 pct over August ingot tonnages. This year they will have advanced less than 1 pct.

Fourth Quarter Plans — The memory still rankles. Of 15 purchasing agents checked, 11 have reduced their fourth quarter buying plans by as little as 6 pct to as much as 66 pct (the latter figure in the case of a large oil company) below fourth quarter 1956. Three buyers will increase their fourth quarter buying over 1956, and one will purchase about the same tonnage. The group includes automotive suppliers, appliance makers, rail car builders, construction equipment producers, farm equipment builders, oil drillers, truck builders.

The entire sample will fall back to about 82.7 pct of their year-ago steel buying levels. Which hints at an operating rate average for the steel mills, if these buyers are representative, of a steel industry operating rate of 85 pct in fourth quarter. The figure coincides with a recent estimate by an eastern steel firm.

Steel Outlook — Best estimates, based on present metalworking sales forecasts, suggest an average of 9-9.5 million ingot tons per month for October and November, with the figure rising to 9.9-10.2 million tons in December.

Suppliers to the automotive industry are buying slowly at present, as is the steel warehouse industry. The two account for about 35 pct of finished steel sales. Both expect to up their buying rate in October, hold fairly steady through November, and then go up again in December. Both are important users of cold rolled sheet and hot rolled sheet, two grades that have been particularly slow in responding to the usual September business upturn.

Close To The Vest—As in 1954, steel buyers admit they are trimming their inventory sails close to the business wind. A good number are hedging their bets. Enameling quality sheet has been a quick delivery item all year. Delivery has become no tighter in recent weeks. Yet a few careful buyers are calling their mill suppliers to make sure their fourth quarter tonnages will be waiting when needed.

At least three steel buyers contacted are already at, or will hit in fourth quarter, a 3-5 year low in their in-plant inventory stocks. In all cases, the reduction will continue through at least November.

Surprisingly, plate is among the items scheduled for culling, in some

cases. Some fabricators and warehouses are reducing stocks of light, bar-size structurals.

What They're Saying — Sample conversations from buyers who spelled out their fourth quarter buying plans:

A producer of major appliances —"We will continue to buy at the year-ago level. At least for now. But we've already reduced our inventory by 50 pct. Frankly, our own manufacturing rate is pretty good. But from what we hear about competitors, we've decided to keep a tight thumb on buying policy at least through December. We hear that our opposition is laying off men. It just doesn't seem like there's need for us to lay in much steel."

A heavy equipment producer— "We've reduced inventory by almost 40 pct this year. We'll keep on doing it through October, at least. We're cutting our new order rate too. We've never been this low on inventory. Not even in 1954. I'd worry more, but our new orders aren't coming up, so I guess we're safe."

Another appliance producer — "We're living dangerously. We're on our way to a five-year inventory low. We've halved our inventory and we'll drop another 2000 tons in the next two months. We're manufacturing one line at about half the rate our consumers are buying. Funny thing is, our sales are picking up and it looks like this might continue."

Railway equipment builder — "Our new order book is on the decline. I think our buying will be 15-20 pct off a year ago. Our inventory will run even through fourth quarter, and then we're going to run it down."

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., THE IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

Ungava Bay Project Makes Headway

Major U. S., German interests said to be set to back mining, concentrating project at Ungava.

The Canadian ore would be shipped to German mills.

▪ A giant, $200 million iron ore project in the Ungava section of Northern Canada is moving right along.

After five years of surveys, trans-Atlantic conferences and studies, a positive plan has been shaped up by Cyrus Eaton, Cleveland financier, and Alfred Krupp, German industrialist and steelmaker.

No capital has actually been invested yet by either of these two, pending the decision by "study companies" on the economic feasibility of the almost unprecedented cold weather operation. But the project is much further along than generally realized.

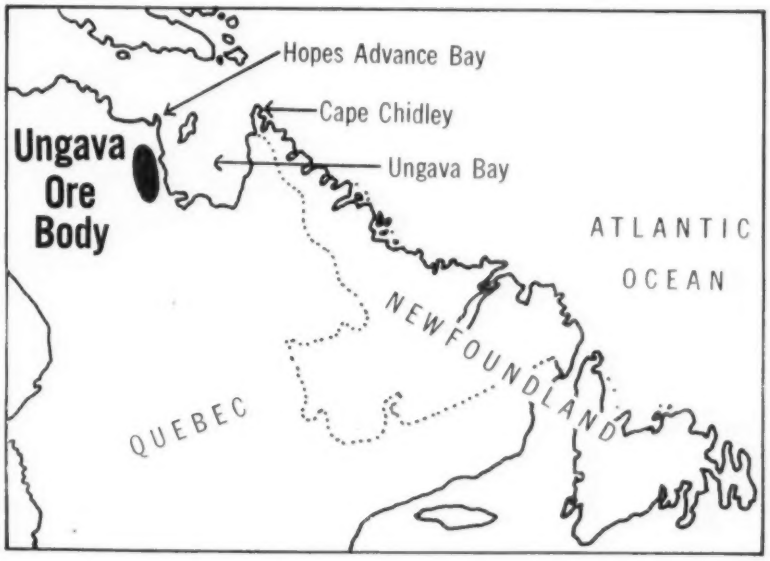
Germans Own Half—Also in with Krupp on half of the operation are four other large German Steelmakers. German mines are now down to about 25 pct iron content ore, and reserves aren't great.

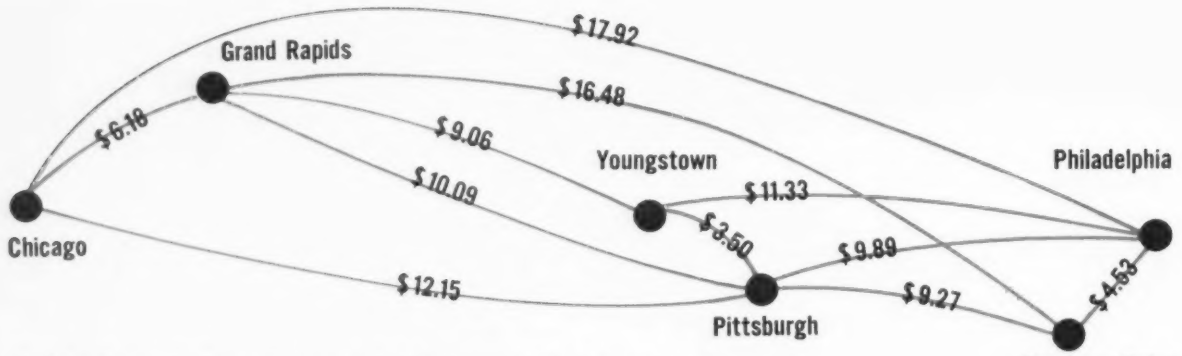
The iron content at Ungava varies from 25 to 50 pct in the ore. There's well over a billion tons available, mostly close to the surface. The general body is 600 miles long, north-and-south, parallel with the west shore of Ungava Bay.

Largest Ships—King size ships, with capacities up to 70,000 tons are planned to carry pellets 2570 nautical miles to Rotterdam for barging up the Rhine River to German mills. Ships will be able to navigate in Ungava Bay only four months of the year. The rest of the time they will carry coal from Newport News, Va., to Rotterdam.

The Ungava Bay project would be the first large-scale mining and concentrating operation close to the tidewater on the North American Atlantic coast.

Kickoff in 1958—Plans call for the start of construction next year of crushing equipment, concentrating and pelletizing plant.





Freight Rates: Dollars per ton of finished steel, including tax.

Freight Angle in Merger Battle

Bethlehem and Youngstown say freight rates restrict steel competition to regions.

Rebut Government argument that over-all size is measure of company's competitive power.

■ Because of the railroad freight rate "barrier," competition in steel is regional rather than national, say Bethlehem Steel Corp. and Youngstown Sheet & Tube Co.

The restricting effect of freight charges was one of the counter arguments advanced by the two companies in opposing the Justice Dept.'s motion in New York's Federal district court for a summary judgment to nip in the bud a proposed merger of Bethlehem and Youngstown.

Companies' Position—The companies also contended that the merger would increase, not lessen, competition in steel, particularly in the Midwest. If the merger is approved, Bethlehem plans to spend $358 million for expansion and improvement of Youngstown's plants.

Some $268 million would be spent in Chicago, where Youngstown's ingot capacity would be upped 2 million tons, and new finishing mills for structurals and plate would be installed. "This," say the companies, "would enable Bethlehem to provide consumers in the Mid-Continent area with a new and important source of supply of heavy structurals and plates which for many years have been in short supply in this area."

Product Expansion — Another $90 million would be spent in Youngstown, O., where ingot capacity would be increased by 600,000 tons and hot- and cold-rolled sheet mills would be built.

In Youngstown, hot-rolled sheet capacity would be increased by 42,000 tons, cold-rolled sheets by 563,000 tons. In Chicago, the following capacity increases would be made: Sheared plates 456,000 tons, wide-flange beams 540,000 tons, standard heavy structurals 180,000 tons, hot-rolled bars 137,500 tons, rolled steel wheels 120,000 tons.

Competitive Pattern—C. H. H. Weikel, manager of Bethlehem's commercial research and industrial development department, spelled out the companies' position on the nature of competition in steel.

"Plant location," says Mr. Weikel, "is a factor of paramount importance which affects, and defines the areas of, competition in the steel industry. That factor, alone, makes ratios or percentages of industry-wide concentration completely meaningless and requires a study of the industry virtually plant-by-plant and region-by-region in order to reach a correct understanding of some of the principal competitive forces in the industry.

Freight Rate Barrier—"The reason for this is that a multi-plant steel producer does not necessarily compete in a particular competitive area with its aggregate capacity. It competes there only with those of its individual plants which are so situated that it is economically feasible and profitable for them to compete in that area.

"The basic reason why plant location has a substantial effect upon competition in the steel industry is that steel mill products are heavy and the cost of transporting them is high in relation to their selling price."

Market Strategy — "Because of the importance of transportation costs, the primary competitive effort of steel producers is to develop a market for their products in the area which their plants can serve better than, or as well as, the plants of their competitors."

Mr. Weikel's affidavit was a rebuttal to the Government's argument that overall company size is the determining factor in its ability to compete. "But nationwide concentration figures," avers Mr. Weikel, "are without significance

Freight Rate Barrier:

How It Restricts Steel to Regional Competition

The more distant the market, the more it costs to ship a ton of steel. That's the nub of argument that competition in steel is regional, not national.

except in an industry having a national market. There is not a national market for steel products."

Size Not Whole Story—In the steel industry, states Mr. Weikel, "large absolute size is necessary for economical performance of certain essential functions, but the whole history and structure of the industry shows that it is not a condition of competitive success.

"Moreover, over-all size is not an accurate measure of competitive power in any particular market for steel products; focusing attention on absolute size ignores the relative size of the companies in the industry, and also ignores the relationship between size and the market to be served."

Cast Factors — A. B. Homer, president of Bethlehem, said his company wants the merger as an entree into the midwestern market "that it cannot economically reach from its present plants." He explained that it would be considerably cheaper to expand Youngstown's existing capacity in the Chicago area than it would to build a new integrated plant.

"The latter course," he went on, "would involve prohibitive costs per ton of new capacity (about $300 per ingot ton) and vastly greater capital resources than are available to Bethlehem and would delay almost indefinitely the provision of certain important new facilities.

"The merger . . . is immediately feasible and would . . . bring a new competitive force. . . ."

Wilson Swings Axe On Defense

Broad plan to cut Defense spending within budget is now under way.

Short-term savings now take precedent over long-term plans to cut back spending.

▪ Top U. S. military leaders are charting a long-pull defense effort featuring pared-down manpower and reduced buying of conventional weapons.

Broad outlines of the Armed Forces organization of the next year or two are spelled out anew by Defense Secretary Wilson. Total military forces, he says, are to be trimmed to 2.6 million by next June 30 by means of a second 100,000-man cut in personnel. The services contained nearly 2.8 million men at the end of August.

Air Wings Cut—To meet the new strength goal, the Air Force will lower the number of its wings by dropping some tactical units. Wings will decline to about 123, instead of the 128 set earlier by the service as its new goal. Present Air Force makeup includes 133 wings. Heavy bomber units are not to be affected by the cutback.

At lease one more Army division will be lost. The Army, with 19 (mostly understrength) divisions early this year, will come down to 15. Number of Navy vessels to be taken out of service is uncertain. An unofficial estimate is that about 30 will be sidelined.

Missile Question—Procurement of small arms and individual equipment is to diminish as the services concentrate on newer weapons, particularly guided missiles. Where possible, as in the intermediate-range missile projects, best features of advanced types will be combined for economy.

Secretary Wilson, tightening the purse strings to keep Defense outlays within $38 billion this year, hopes to have a decision soon on which midrange missile will be built—the Army Jupiter, Air Force Thor, or a combined form. Best indications are that the final missile will have some elements of both the present ones.

Time Is Now—Primary difficulty involving cutbacks already ordered is the time at which the results will be visible. Buying of new jet planes, including the F-101, F-104, and F-105, was stretched out this year, but economies weren't immediate. It will be 1958 or 1959 before such stretchouts will show savings.

Long-run savings are less important to the Pentagon budgeters at this time than are short-term savings. They are ready to explore areas where projects not actually required, as in the case of the newly-cancelled Triton missile, can be dropped.

Administration Stymied On Inflation

At this point, it's hard to see how the Democrats can fail to sap Republican strength with the issues of inflation and high interest. Nobody wants them and politicians who denounce high prices always win friends.

Inflation is a troublesome, nagging problem in the White House inner circles. But nobody in President Eisenhower's official family admits to knowing how to cope with it.

There is the usual talk of "appealing to the better nature" of business executives to hold down prices and to labor leaders to forego wage demands.

Unique Program Sells More Pipe

Order Makers Institute Pays Off for Republic

In less than two years Republic Steel's distributor training program proves its mettle.

Now the company will use the same idea in another major division.—By T. M. Rohan.

■ Pipe salesmen these days are finding Republic Steel Co. running ahead of the pack. The answer is in Order Makers Institute (The IRON AGE, May 3, 1956), a unique sales program for Republic's distributors who handle about 70 pct of pipe tonnage.

Republic isn't saying exactly how far ahead it is running. Industry average production rate was 76 pct of capacity the first five months of this year and Republic's sales of pipe have been running about $750,000 a month in excess of this production figure. Division earnings have had a decided upswing.

Idea Spreads—Republic's plastic pipe sales doubled in the first five months this year. They got a strong plug in the distributor meetings. Next month, the company is extending OMI to a second major division. Other products are also being discussed. First of the new meetings will be held before the end of the year.

The program was conceived at the bottom of the 1954 inventory readjustment by N. W. Foy, sales vice president, and L. S. Hamaker, general sales manager. It was launched early last year with six special movies, flip charts, comedy skits, pretty girls and hoopla to get distributors interested.

Revives Art of Selling—The program also included the hard sell for distributor salesmen, many of whom had never been in a steel mill. Over 800 meetings have been held for about 10,000 home office and branch salesmen of Republic jobbers. Many also brought secretaries, countermen, and truck drivers—all of whom attended with interest.

Results of the program have been far more reaching than just selling additional pipe for the company. Republic surveyed distributor principals, its own district managers and meeting leaders. The company found some unusual developments. Jobber salesmen, for instance, are using OMI information directly in their day-to-day work and are getting better results. Jobber principals use the course to help evaluate their salesmen.

In the pipe boom of the past 15 years, selling had become a neglected art, the distributors claimed.

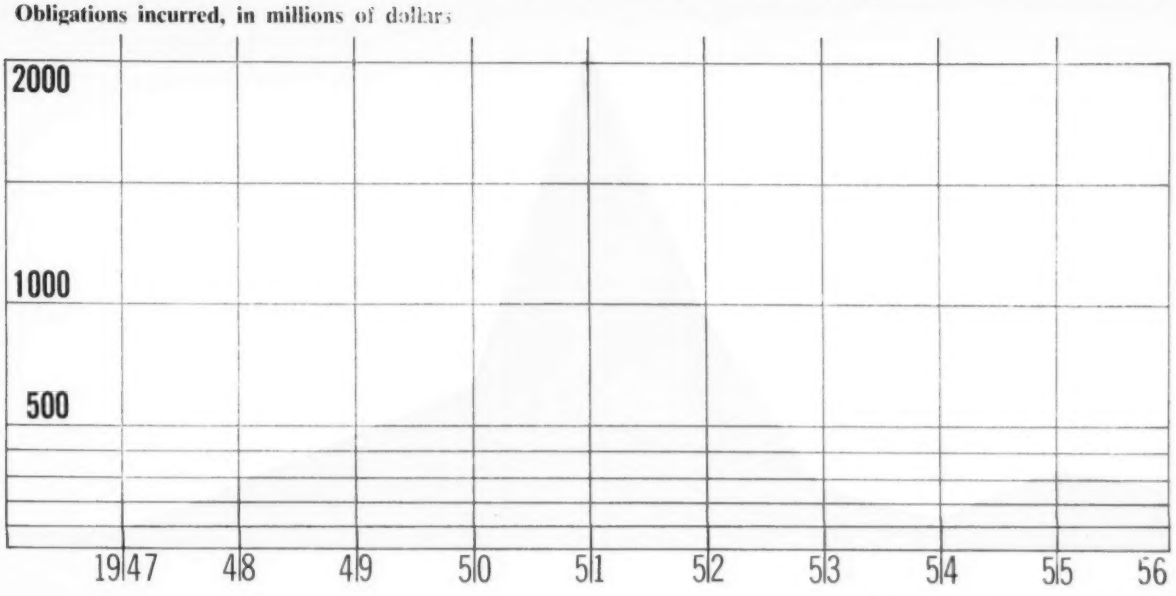
Older salesmen had become rusty and new ones had never faced a prolonged buyers market. Most distributors could ill afford the time and expense of a major training project. They welcome OMI as a shot in the arm to their salesmen.

Helps Make Friends—Competitors have openly admired the program and know the jobbers were impressed. Republic meeting leaders, 100 strong, realize they have learned more about pipe and salesmanship. Some of this they got from their students.

Republic's men have also worked out a close relationship with distributors who are representing the company to customers. Steel salesmen seldom had met the jobber before. Many are now on a first name basis.

ORDER MAKERS MEET: Invitations to steel pipe sales meetings get enthusiastic response from distributor firms. Attendance has topped 10,000.

How Stockpiling Program is Shrinking



1957, first half $70,016,689

Stockpile Spending Fading Away

Buying to Be Limited to Very Scarce Items

ODM probe, congressional criticism signal the end of major stockpile buying.

Key factor: Planning is now in terms of a "short war."

One or two very scarce items only are expected to escape the axe.—By N. R. Regeimbal

▪ Government stockpile buying is apparently destined to join tax amortization in the graveyard of once-broad mobilization programs.

Top mobilization officials aren't ready to pronounce stockpiling dead yet, but there is every indication it will shrink rapidly until procurement is limited to one or two extremely scarce materials.

More Are Critical—The Office of Defense Mobilization has quietly opened a broad review of the basic policies of the program. A growing number of congressmen, fired up by the economy flame, are criticizing the program as a pure subsidy in most cases.

Such a review, on top of congressional criticism, led to the drastic curtailment of tax amortization last year.

Already, the number of materials being purchased has been cut from a high of 76 to 10 — amosite asbestos, electrolytic chromium, fluorspar, jewel bearings, lead, two types of manganese, mica, selenium and zinc. Key materials no longer needed are aluminum, abrasives, bauxite, chromite, copper, magnesium, nickel, titanium sponge, tungsten, and tin.

More important, the size of most goals has been cut by 40 pct.

Plan for Short War — Principal factor in the coming near-demise of stockpiling is the transition from planning for a conventional long war to an atomic, or "short war." The days when it was necessary to prepare for a five-year fight are history. Stockpile purchasing has been shaved to meet the expected deficits for only three years of battle.

High defense officials say that even the three-year plan may shrink as mobilization planning catches up with missile development.

Mountains of Material — There are other factors in the cutback. Government economy and a shrinking budget is one. In addition, mountains of materials piled here and there around the country testify to the fact that many of the original goals have been filled. Development of substitute materials, changing manufacturing needs for weapons, and new capacity also contribute.

Because only 10 materials are under active procurement, the effect of the cutback in stockpiling

won't be widespread. But it will be serious to several industries.

Lead and zinc producers will be among the hardest hit.

Almost Full — The government has already filled its minimum needs for these two metals, and is close to filling the "long term" goal established by President Eisenhower in 1954 primarily as an aid to producers. It will be "only a matter of months" before the long term goal for zinc is filled. A few months later lead will hit the top.

A year ago, the hard pressed tungsten producers faced the same problem. When the goal was filled, government buying stopped dead. However, Congress authorized a new buying program through the Interior Dept. to help the industry —but this was not a defense program. Last session, Congress balked at appropriating more money, and no tungsten is now being acquired.

Seek Tariff Aid—Lead and zinc producers are seeking aid through a bigger tariff, which they hope will help them secure a bigger share of the market. Copper producers, also in trouble, may take similar action.

Congress next year will be asked to survey the entire mineral problem. The Administration has proposed a "long range" minerals program, which would provide sliding tariff protection for lead and zinc.

Background—The history of the stockpile program: Buying rose from $68.8 million in 1947 to a peak of $2 billion in 1951 with the outbreak of the Korean War, tapered back in 1954, rose again in 1955 with the advent of the "long-range" buying program, and has tapered off again sharply.

Doesn't Count — The original goal was for $2 billion, but this was expanded to $6.4 billion. The "long-term" program, added in 1954, brought the figure to $11 billion. This dollar goal has never been reduced officially, but with the cutbacks in the tonnages of materials wanted it is no longer a measure of the program.

New Adhesive Bonds Plastic to Metal

▪ A strong adhesive capable of joining polyethylene with rubber, brass, and brass plated metal has been developed by Bell Telephone Laboratories. It is claimed to be many times stronger than any bonding agent now used for this purpose.

Based on a synthetic material known as "partly hydrogenated polybutadiene," the adhesive is so strong it will resist a pull of approximately 1000 lb psi—much stronger than present-day pressure-sensitive adhesives, according to Bell.

Easily Applied—Application of the polybutadiene product as an adhesive and the physical processes necessary to make it possible are the work of Henry Peters, of Bell Laboratories' chemical research department.

The bonding is accomplished with heat ranging from 250° to 350°F, and pressures of 100 lb psi or less. Higher temperatures and pressures may be used. The process may be extended to plastics related to polyethylene, Bell reports.

A Longtime Problem—For many years industry has needed a strong adhesive to use with polyethylene. One of its principal industrial applications is its use as a covering for telephone cables.

Industry sources estimate that polyethylene will be the first billion-pound-a-year plastic. This level of production may be achieved by 1960.

Some possible uses: Bonding of wire insulation to conductors, bonding of linings to tanks, application of polyethylene coatings on plating racks, protection of metals from corrosion.

SOLID SANDWICH: New superstrong adhesive developed by Bell Telephone Laboratories makes it possible to join polyethylene to rubber or brass. Sandwich shown can support about 2000 lb; resist pull of about 1000 psi.

PREDICTION: Odds favor a steel strike in 1959 and an auto strike next year, says IRON AGE's Tom Campbell.

1958 Business Still Looks Good

NICB speakers see only a few weak spots in the immediate future. Long-term outlook is even better.

But metalworking will have to wait for another record-setting period.—By G. G. Carr.

▪ Good and better business next year is confidently predicted by top spokesmen for key industries. And the long-range outlook through 1961 is even better.

That's the gist of statements by top authorities in a cross section of American business presented at National Industrial Conference Board's fifth annual marketing conference in New York last week.

Add up the separate short and long-term forecasts and you get an industry-by-industry picture that focuses down to this:

Steel—The IRON AGE's Editor-in-Chief Tom C. Campbell predicts the steel industry will start 1958 in high gear, then lose a little steam about May. After the usual summer slump, the mills will roar throughout the fourth quarter. He sees no serious recession for the steel industry next year.

But he warns that the three-year labor contract makes it easier for steel users to anticipate their needs without rushing into the market on short notice.

Up to Automotive—Detroit will call the turn next year, Editor Campbell forecasts. If '58 models sell no better than the '57's, flat-rolled demand should stay relatively light from next May until September. But fall will see a rush for steel for 1959 models.

Choice of April or May as a cutoff point for heavy sheet demand rests on his belief that automakers will fill dealers to the roof early in 1958 to avoid the effects of a possible auto strike, for which he sees a 65-35 chance.

Admitting that new plant and equipment spending may level off next year, the IRON AGE editor thinks that any decline in this area will be mild. There is an even chance that the drive to cut labor costs through new equipment may push 1958 even with or above 1957, he predicts. In any event, capital spending will be an important steel market next year.

Stainless Looks Up—Mr. Campbell believes there is a 60 to 65 pct chance of a steel strike in 1959. And negotiations will almost certainly be followed by a base price rise. Mr. Campbell also predicts a general steel price rise in July, 1958.

He singles out stainless steel as having better than average prospects in 1958. Nickel supplies will be more ample, permitting stainless producers to push nickel-rich grades in markets which they have not been able to exploit fully.

Long-Term Outlook — Looking ahead to the 1959-61 period, Norman Foy, vice president, sales, Republic Steel Corp., summed up the long range outlook as "good, better, and best. . . . The long term view is the best that any nation has ever been privileged to anticipate," he says.

As specific indicators, Mr. Foy predicts auto output averaging 6.5 million cars annually until 1960, then rising to keep pace with population, family formation and average income. Housing should hit its low in 1957 or 1958, then rise sharply. School and road building should fatten the construction pic-

ture, but industrial construction will probably slow until the 1960's, then begin to rise. Machinery and appliance industries should rise in 1960-61.

Nonferrous—Braving the hazards of long-range nonferrous predictions and assuming adequate supply, Charles Winship, Jr., general sales manager, Phelps Dodge Corp., believes 1960 copper, lead and zinc consumption will look like this:

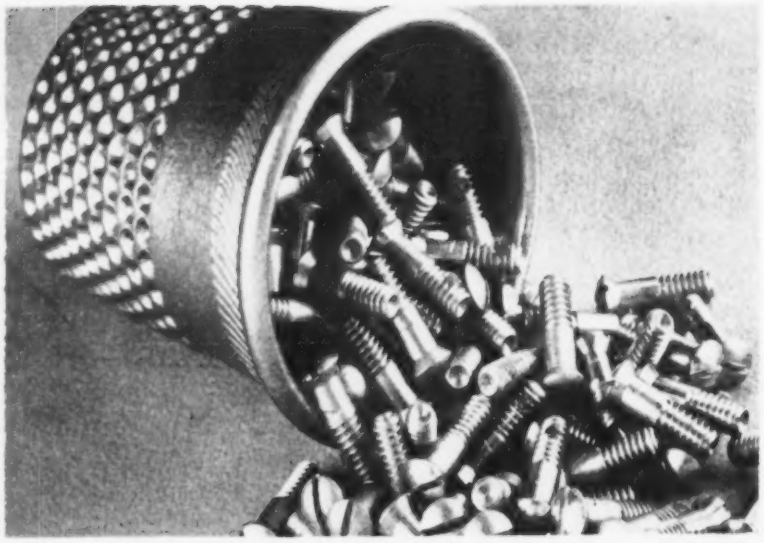
Copper: 3.6 to 4 million net tons. Lead: 2.1 to 2.3 million net tons. Zinc: 2.5 to 2.7 million net tons.

Machinery — Chief problem of the machinery industry next year will be a sales problem, according to C. M. Beach, vice president, Cincinnati Milling & Grinding Machines, Inc. Commerce Dept. estimates that capital spending late this year and early in '58 will be at the rate of $37.9 billion annually. This is about 6.5 pct above 1956 and about 22.5 pct above 1955. But, he comments, about half of the 6.5 pct gain will be due to higher prices.

Mr. Beach believes machine tools should account for about $800 to $850 million of the $37.9 billion figure.

Construction — Construction activity for 1958 is very promising and should at least equal 1957 volume, reports Raymond C. Daly, president, George A. Fuller Co. Actual work done during the first half of 1957 has been about 3 pct above the same period last year, and contract awards are about 5 pct ahead. Execution of existing contracts should maintain the present pace through 1958. But there are some signs that major companies may cut expansion plans, affecting 1959 volume.

Chemicals — Chemical sales for 1957 and 1958 will again set new records of $25 billion this year and $27.5 billion next year, forecasts John O. Logan, vice president and general manager, Industrial Chemicals Div., Olin Mathieson Chemical Corp.



EYE-CATCHING: Timble shows the size of lock bolts for eyeglasses.

Lock Fasteners Probe Auto Market

▪ It looks good for lock fastener makers. Business this year has been excellent. The outlook is for even higher sales, supported by the belief that one of Detroit's Big Three will soon standardize 100 pct on lock fasteners for all automotive applications.

Lock fasteners stay put; they can not work loose. Good business and fine future are due to continued emphasis on reliability, according to R. E. Waldo, president, Nylock Corp., Paramus, N. J.

Heat a Problem—Several locking devices have been used at one time or another. But probably the most efficient type is a plastic ring or plug set into the threads of a male or female fastener.

Manufacturers believe that high temperatures, which could cause trouble with present plastic inserts, are a problem that will be licked before it becomes serious. But it could be serious. Prime market for lock fasteners is in aircraft and missiles, 50 pct of Nylok's dollar volume, for example. Here is where temperature could show up as a problem on a large scale.

Other hot markets include appliances and home equipment. Here the reliability factor can be of prime sales importance. Electronics should be a steadily growing market.

Auto Potential—But the automotive potential is far and away the most exciting. Lock fasteners have strong arguments for universal use there.

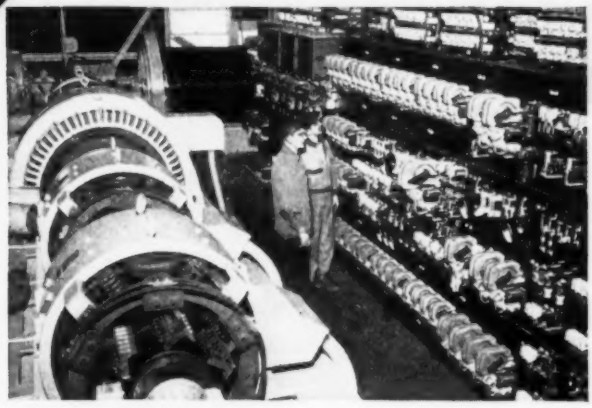
First, because warranty costs are now charged back to the automaker, some sources believe their use would save an average of $5 per car here alone.

The 1958 Ford will use more than 100. But 100 pct use would mean a lot more. In the meantime, Nylock is working with the railroads on tests of lock bolts on rail tie plates. If tests prove out, the rail market could dwarf anything now in sight.

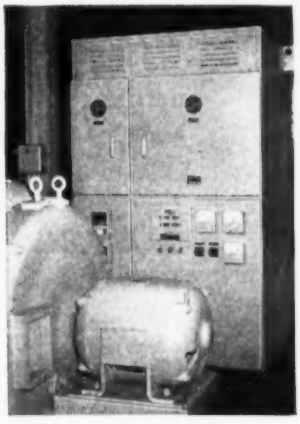
1800-TON-PER-HOUR DRAVO UNLOADER IN OPERATION AT PENNSYLVANIA RAILROAD'S GREENWICH POINT, PHILADELPHIA, ORE UNLOADING PIER

You're Under Way *Fast* WITH EC&M ADJUSTABLE VOLTAGE CONTROL!

EC&M Adjustable Voltage Control Panel *(mounted on trolley)* for Hold and Close Line Motors and for Trolley Motor, plus Protective Panel for other drives.



EC&M Control Panels for Hold Line, Close Line, Trolley, Turntable, Quadruplex Travel, Rail Clamps and Apron Hoist Motors are mounted in Machinery room, 100 feet above ground level, along with generators which supply DC power for unloader motors. Power resistors, mounted above Panels, are EC&M TAB-WELD.



EC&M Type ZHA 4160 Volt Starter provides pushbutton starting of 800 HP Elliott synchronous motor driving 4 generators.

This Dravo Unloader is typical of many prominent installations on which EC&M has worked with both unloader and motor builders to get machines into production quickly with minimum adjustment and "tune-up" time.

Equipped with a total of 20 motors ranging in size from 10 to 800 HP, this unloader takes giant-sized bites (22½ tons) of ore from a ship's hold on an average cycle handling time of 45 seconds. Frequently, the skilled operators lower the time to 36 seconds per trip.

The bucket (hold and close line motors) and trolley drive are operated by adjustable voltage control under current limit acceleration through rotating regulators. Constant potential control is used for the travel, rail clamps, turntable and apron hoist.

EC&M is prepared to supply complete equipment including control, brakes, limit stops and all rotating machinery. When planning adjustable voltage installations, consult EC&M for engineering assistance.

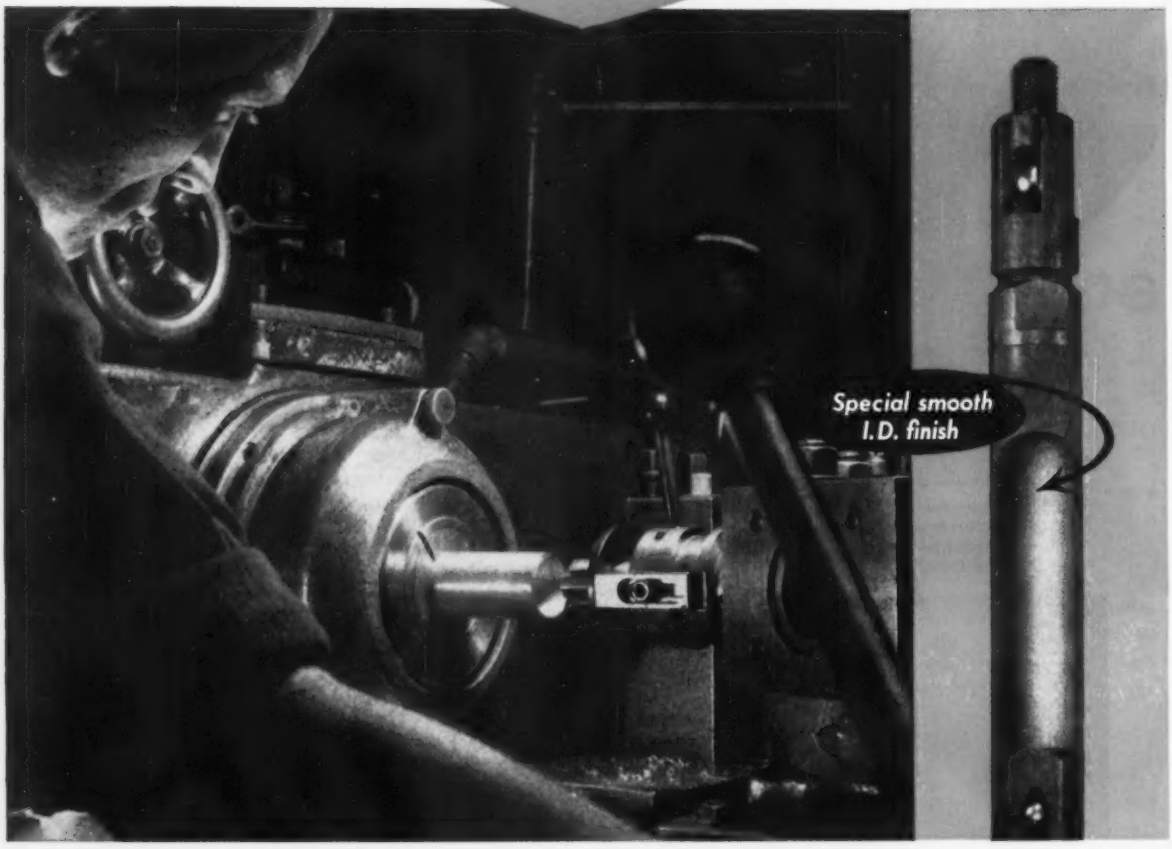
Photos courtesy Dravo Corporation, Elliott Company and the Pennsylvania Railroad

THE ELECTRIC CONTROLLER & MFG. CO.
A DIVISION OF THE SQUARE D COMPANY
CLEVELAND 28 • OHIO

EC&M'S 60TH ANNIVERSARY • 1897-1957

9104

This pump manufacturer reports 25% savings with J&L COLD DRAWN ELECTRICWELD TUBING



Operator is threading 1¾" O.D. x 1½" I.D. J&L special smooth *cold drawn* Electricweld tubing for pump cylinder.

Low original cost and elimination of interior honing are two reasons why it pays you to specify J&L *cold drawn* Electricweld tubing with special smooth I.D. finish.

This manufacturer of oil well insert pumps reports a saving of 25% by converting from honed seamless tubing to *cold drawn* special smooth I.D. Electricweld tubing. Not a single tube failure has been reported from the field.

Because of its superior inside surface finish, exact tolerances and closely controlled physical characteristics, J&L *cold drawn* Electricweld tubing is recommended for these applications:

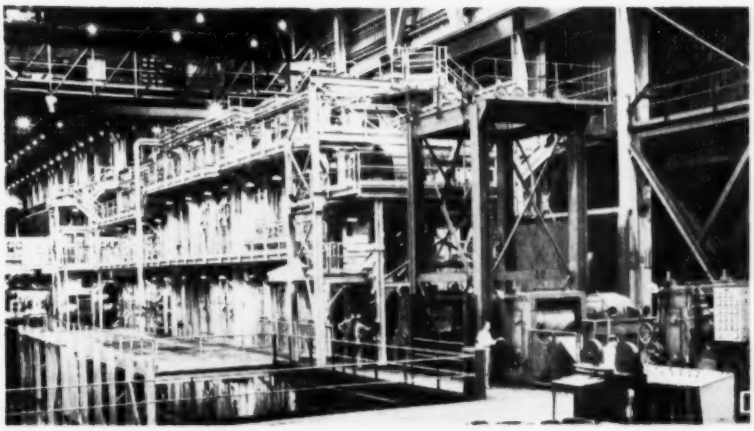
- *cylinder tubing* • *shock absorbers*
- *ordnance parts* • *hydraulic and pressure tubing*

J&L *cold drawn* Electricweld tubing is readily available in diameters from ¾" O.D. to 4¼" O.D., 8 gage to 20 gage, and can be furnished to closer than commercial tolerances. Write to Jones & Laughlin, 3 Gateway Center, Pittsburgh 30, Pa.

J&L STEEL

Jones & Laughlin

. . . a great name in steel



ANNEALING FURNACE: New continuous line at Weirton Steel handles 2000 ft of strip per min. Line, in tin mill department, is part of parent National Steel's expansion of nearly $500 million in past 5 years.

Boost Graphite Output

Seven years of expansion, totaling $50 million, added 100,000 tons of carbon and graphite to the annual capacity of National Carbon Co., division of Union Carbide Corp.

The project was spread over all major plants of the company, including Columbia, Tenn.; Niagara Falls, N. Y.; Clarksburg, W. Va.; Cleveland and Fostoria, O. A new plant is being brought in at Lawrenceburg., Tenn., using a new process for forming and baking.

One of the major accomplishments, in addition to the boost in output, was the development of specialty carbon and graphite; nuclear grades for reactors, and reference forms for aircraft assembly brazing.

Barium Moves Ahead

Engineering for the new Barium Steel Corp. mill to be built on the Delaware River in New Jersey is nearing completion.

J. A. Sisto, chairman of the board, reports that equipment costs should be determined by the end of October. The $46 million facility is designed to produce 800,000 tons of steel annually.

Mr. Sisto stated that arrangements have been made with banking institutions and equipment suppliers for a substantial portion of financial requirements for the new facility. This is in addition to the recent sale of a $10 million debenture issue.

The Barium chairman is now in Europe consulting with equipment suppliers in England and Germany who are interested in supplying equipment for the new plant.

Improvement at Midland

Crucible Steel Co. of America, Pittsburgh, plans to spend $20 million to improve primary mill facilities at the company's Midland, Pa., plant.

A special meeting of stockholders has been called to authorize issue of cumulative convertible preferred stock to raise part of the cash. The rest will come from sale of mortgage bonds.

Project will include purchase and installation of new electrically driven blooming and slabbing mill, modifications to the hot strip mill, and additions and improvements in slab heating and other auxiliary equipment.

Brazil Has Iron Ore

The first detailed mapping and appraisal of the iron ore deposits in the Congonhas District, Brazil, reports ore containing about 15 billion metric tons of metallic iron.

The project was launched in 1940 by geologists from this government's Geological Survey, Dept. of Interior, along with Brazilian experts.

Easily Extracted — The initial report claims about 39 billion metric tons of low grade iron ore, containing 20 billion metric tons of hematite. Of the 15 billion metric tons of metal, about half lies within 100 meters of the surface.

Boards Approve Merger

Boards of Directors of Copperweld Steel Corp., and Superior Steel Corp. have formally approved a plan under which Superior would merge into Copperweld.

Three-fourths of a share of Copperweld stock would be issued for every share of Superior.

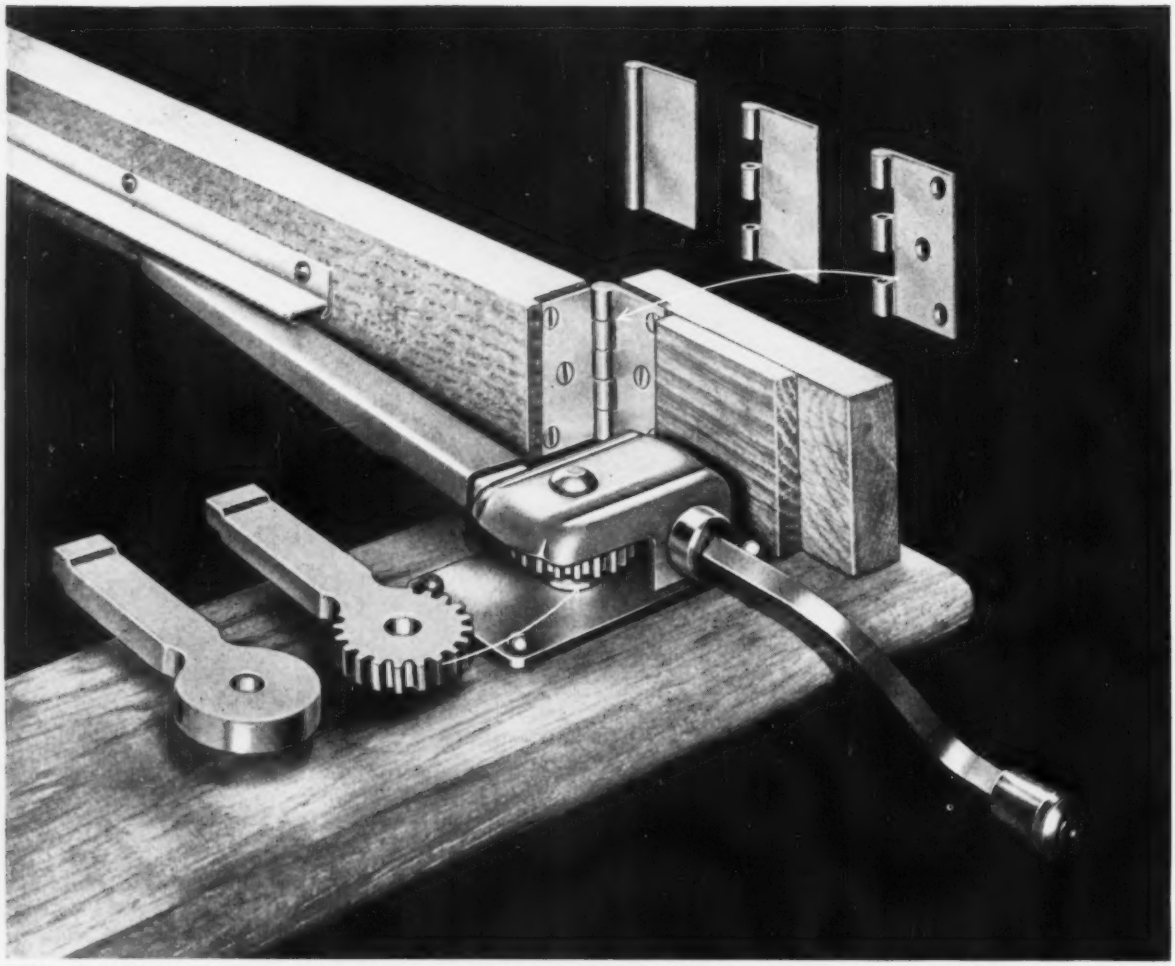
Stockholders of both companies will meet in Pittsburgh on Nov. 8.

New Alcoa President

Frank L. Magee, formerly executive vice president, has been named president of Aluminum Co. of America.

He succeeds I. W. Wilson who becomes chairman of the board, replacing A. V. Davis who retired last month.

The new president has been with Alcoa since 1917, and a director for five years.



DEMONSTRATION UNIT for the Casement Window Operator, a product of The H. S. Getty & Company, Inc., subsidiary of Trans Continental Industries, Inc. At left on sill is Anaconda Die Pressed Forging for the operating arm gear. To its right is the finished part after trimming operations around circumference of gear head and in the hole—and hobbing teeth in. Upper right: hinge blank cut from long mill length of an Anaconda Extruded Shape – blank with slots milled and pinholes drilled in knuckles – finished hinge leaf.

How Anaconda die pressed forgings and extrusions cut costs for Getty*

Forgings save 30%. The H. S. Getty & Company, Inc., Philadelphia, is a leading manufacturer of marine, window and builders' hardware. They used to fabricate the operating arm gear for their casement window operator (above) from a leaded sheet brass stamping. The American Brass Company suggested a switch to die pressed forgings. Getty tried it, doing a trimming operation in the hole and periphery of the head – then hobbing in the teeth. Metal saving on each unit was 7 ounces. Machining was cut 10% – for an over-all saving of 30%.

Extruded shapes cut machining and finishing. The illustrations above right show the steps in fabricating Getty butt hinges from an Anaconda extruded shape. This short cut to a superior product gave Getty a simplified shop production routine that eliminated several costly machining and finishing operations – because the extruded shape has the exact cross section of the finished hinge. And, because of the dimensional accuracy of extruded shapes, each part is readily adaptable to drill jigs and milling fixtures. These precision hinges will perform well, too, because extruded metal is *wrought* metal – tough, strong, and dense-grained.

Find out how Anaconda short cuts can help you. If the production possibilities of die pressed forgings or extruded shapes look promising to you, send us a sketch, sample, or description of each part you have in mind. We'll be glad to tell you about costs – and about possible savings, too. Address: The American Brass Company, Waterbury 20, Connecticut. 5778

*Subsidiary of Trans Continental Industries, Inc.

ANACONDA®

DIE PRESSED FORGINGS

EXTRUDED SHAPES

MADE BY THE AMERICAN BRASS COMPANY

Herbert Harig

Builder of Better Apprentices

Haphazard handling of apprentice training can have adverse long-range effects.

Mr. Harig, who went through the tool and die training mill himself, is out to improve instruction methods.

With the trade becoming more complex each day, he says, more thorough training is needed.

■ For a man whose introduction to the tool and die industry was a job counting poker chips, Herbert Harig has come a long way. Now president of the National Tool & Die Manufacturers Assn., he is one of the industry's leading exponents of better apprentice training.

He began his formal apprenticeship at Chicago's Brust & Harig Manufacturing Co. back in depression-ridden 1932. The tool and die company which his father, Karl, was then associated with was keeping its corporate head above water by producing fiber poker chips.

HERBERT HARIG: Keeping up to date is a constant challenge.

A Rough Road—Herb worked directly under his father. He recalls that he spoiled quite a bit of work and was "constantly catching the dickens" for it. He went to night school and took all of the limited related training courses then available. Still, the road to skilled craftsmanship was rough—even for the boss' son.

These early frustrations undoubtedly account for Herb's work in behalf of better apprentice training. For several years he has been spearheading NTDMA's efforts to produce its own series of textbooks for related classroom training. Publication of these much-needed books will be for him the realization of a 15-year ambition. Tomorrow's apprentices will benefit.

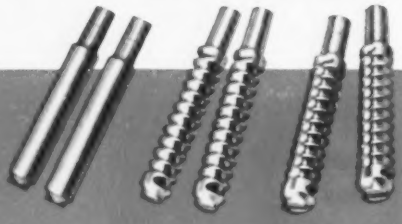
Perpetual Student—To this year's crop of new tool and die makers Mr. Harig has this advice: "Don't lose sight of the fact that you still have a great deal to learn to be a finished mechanic. Our trade is becoming more and more complex, and the need for keeping up to date is a constant challenge. Even though you are through with your apprenticeship, do not stop going to school."

After Herb Harig finished his apprenticeship in 1938, his own training followed sales and administrative lines. At Harig Manufacturing Corp., founded by his father the year before, he served a short stint as shop foreman, then was assigned to sales development work. For the next seven years he functioned as sales manager, estimator and engineer. He became vice president in 1946, and last year, when his father moved up to the board chairmanship, Herb was elected corporation president.

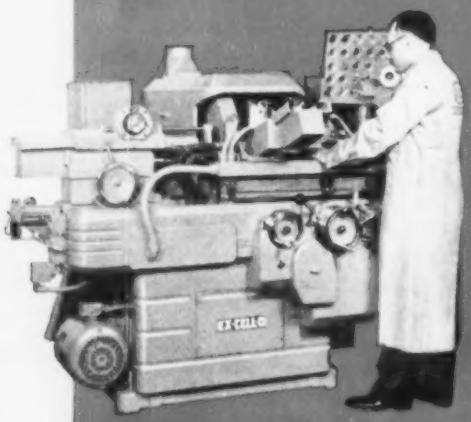
In tool and die industry activities also, Herb has followed his father's lead. Like his dad, he served as president of the Tool & Die Institute of Chicago. His father had been a founder-member of NTDMA in 1945.

Father and son together built their company, now located in Niles, Ill., into one of the country's larger tool and die operations. But to keep quality high, says Herb Harig, you must have well-trained workers. Making apprentices count poker chips isn't the answer.

Precision Threads Roughed And Finished



Automobile steering gear ball-race screws in three stages of processing: blanks, rough-ground, and finish-ground.



Ex-Cell-O Style 33 Thread Grinder equipped to automatically grind steering gear ball-race screws.

XLO EX-CELL-O FOR PRECISION

57-73

Automatically!

These automobile steering gear ball-race screws are rough-ground from the solid on an Ex-Cell-O Thread Grinder. This operation was formerly done by thread hobbing or milling. The screws then go into the machine illustrated, an Ex-Cell-O Style 33 Thread Grinder, equipped for automation. It self-loads, locates, finish-grinds, and ejects steering gear screws. What's more, when desired, the wheel can be automatically dressed after completing a predetermined production. It increases hourly per-unit output over manually operated machines while actually decreasing the number of rejects. A double saving.

Ex-Cell-O Precision Thread Grinders come in a wide range of models—some best suited for toolrooms and short runs, others designed for fully automatic, high volume output. In all, there are five models adaptable to any production requirement.

Why not find out today how these Ex-Cell-O Precision Thread Grinders may be able to reduce your per-unit costs? For full information, just call your nearby Ex-Cell-O Representative.

EX-CELL-O CORPORATION *Machinery Division*

DETROIT 32, MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS • GRINDING AND BORING SPINDLES • CUTTING TOOLS • TORQUE ACTUATORS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

Trouble Spots for Small Business

Not everyone agrees with the small businessman that his big trouble is financial.

He isn't likely to warm up to big business' suggestion that research and development and personnel are more important to him than the financial side.

▪ If you are one of those hard-pressed small business executives, you probably have a pretty good idea of what your problems are; and what you need to solve them.

And it's possible that you were in Washington this week hearing everyone from the President and Secretary of Commerce on down telling you how to solve them. (At the President's Conference on Technical and Distribution Research for the Benefit of Small Business.)

As Others See You — But whether you caught all that good advice and aid, you might be surprised to learn that not everyone sees your problems in the same order of importance that you do.

A private survey of industrial firms and government agencies and servicing industries was conducted in advance of the President's Conference. Its purpose was to find out what small business' major problems are, not only as small business sees them, but as others see them.

Difference of Opinion—Not all were in agreement, if that's any surprise to you. Nor are small businessmen in any near-unanimous agreement on their own problems.

Small businessmen themselves say financing is their major problem. Government and servicing industries agree. But big business believes their smaller competitors have more trouble with research and development and personnel.

A guess is that most small businessmen, scrambling to beat tight money and taxes, will get little satisfaction of the "ivory tower" approach of their bigger, and better-financed, competitors.

How They Voted—Small business firms listed their major problems in this order: Financing, 34.5 pct; personnel, 21.3 pct; sales, 16.5 pct; research and development, 12.8 pct; government interference, 10.4 pct; and production, 4.5 pct.

Among the government and servicing industries polled, financing was listed as the major small business problem by 27 pct; personnel, 25.2 pct; research and development, 19.3 pct; sales, 17.4 pct; government, 9.1 pct; and production, 1.9 pct.

But 34.1 pct of the large firms say research and development is the major small business problem. Some 22.7 pct believe it is personnel. Finance ran third with 20.5 pct. Sales were listed by 11.4 pct; production by 6.8 pct, and government by 4.5 pct.

Help From Consumer Durables

Encouraging Sign—One of the encouraging signs to be gleaned from late summer business is the improvement in consumer durable goods manufacture. This is in relation to the level of a year ago and also to the early summer months.

Production of heavy consumer goods has not been discouraging. But it has lagged behind some of the other segments of the economy. This lag has been responsible for some of the spottiness that has occurred in the midst of a general boom.

The Figures—According to the Federal Reserve Board, the consumer durables index, adjusted, rose from 129 in June and July to 133 in August. The index was 127 in August a year ago.

In the major consumer durables sub-category, the index rose from 137 in June and July to 143 in August. Autos jumped from 134 in July to 148 in August. The increase in the auto index should perhaps be qualified. New model shutdowns are a bit later this year than usual, giving the automotive picture a somewhat better-than-deserved rating.

Building Picks Up

A Comeback—Some steam is apparently coming back into the housing industry. Don't get too excited about it, but there is evidence of a pickup.

In August, some 92,600 private homes were started, an increase of 2,400 over July. The August figure represents an annual rate of 1,010,000, the first time this year the rate hit the million mark.

But, in addition, FHA reports applications for mortgage insurance hit 57,500 in August. This is the highest figure since the fall of 1955, indicating stepped up plans.

Automakers Top Metal Buyers

More Than 10 Million Finished Tons Used in '57

All things considered, 1957 was a good year for the auto industry and its suppliers.

Unit sales will probably pass the 6.2 million mark; close to last year's total.

It adds up to heavy ferrous and nonferrous metal purchases. —By H. R. Neal.

▪ The automobile industry can be likened to a long freight train loaded with a goodly portion of the nation's economy. Like any train, it has to stop to refuel occasionally. The auto industry does this every autumn when it changes from one model to the next.

The train has been slowing down for several weeks now. By the end of this week the train's last car will just about have ground to a halt, marking the end of production for 1957 cars. But even before the last car has bumped to a stop, the lead cars are already in motion and gaining momentum. The train's moving on to its next destination —1958.

Looking Back — Raw materials are the fuel consumed by the auto industry, and this train has gulped a lot of fuel in the 1957 model year. Not as much as some other years, but enormous quantities nonetheless.

Preliminary estimates by Ward's Automotive Reports place U. S. passenger car production at 6,211,-309 units for the model year. This is about 76,000 units on the shy side of the 1956 model year total, but still a good year.

Measure of Materials — What does this mean in terms of materials consumed? Exact figures would be difficult to determine because of differences among the various makes of cars and the models of each make. Optional equipment makes a big difference, too.

However, some idea of the enormous appetite of the auto industry can be gained by taking a typical car and doing a little simple arithmetic. To simplify the math involved, model year production is rounded off to 6.2 million units. Weight per car of a particular material is reduced to tenths, hundredths and thousandths of a ton. The two figures are then simply multiplied.

Carbon Steel Is First—The representative vehicle being used for the figures is the volume production car of one of the Big Three auto makers. It is a deluxe model equipped with automatic transmission and power steering. This particular car and model is used because the materials breakdown is handy. Total car weight is 3570 lb.

Plain carbon steel is far and away the largest single material found in a car. It accounts for slightly more than 60 percent of a car's weight. This car used some 2274 lb. of car-

Walk or Ride This Radio Tags Along

▪ A compact, all-transistor radio that can be used as a standard car radio or as a portable will be offered as optional equipment on the 1958 Oldsmobile.

Called the Trans-Portable, it weighs less than three pounds and is 6½ in. long. When installed in the car, it fits into the instrument panel and automatically plugs into the car's electrical system.

The radio is finished in leather-like plastic, contains its own speaker, loop antenna, and dry cell batteries good for 160 hours.

When installed, it also uses the car's outside antenna and loud-speaker system.

A giant 250-ton teeming ladle (shown above) fills a train of ingot molds at Great Lakes Steel.

Cooling the empty molds with a water spray (below) gives more uniform cooling rate, assures return of molds at proper temperature.

How Great Lakes Steel *coats ingot molds* for quality

At Great Lakes Steel, ingot molds get a high-temperature resinous coating by means of America's fastest spinner applicator (see picture above). Rotating at 1,700—2,000 rpm, the applicator applies a more even coating to the molds. In just ten minutes, 28 molds are lined with a highly protective shield for the ingot surface. Repeated before each use, this added step in production helps eliminate defects by repelling splashes of molten metal from the mold walls.

This is only one of the hundreds of methods and operations used by Great Lakes right from the start of steel making to maintain the high and uniform quality of its products. This uniform quality can mean real savings to you.

It's easy to get the full story of Great Lakes quality—and dependability, too. Simply pick up your phone and call our nearest representative.

GREAT LAKES STEEL CORPORATION

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NATIONAL STEEL CORPORATION

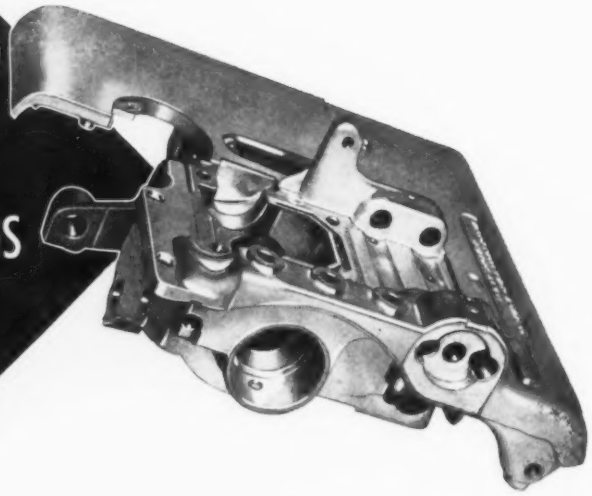
District Sales Offices: Boston, Chicago, Cincinnati, Cleveland, Grand Rapids, Houston, Indianapolis, Lansing, Los Angeles, New York City, Philadelphia, Pittsburgh, Rochester, St. Louis, San Francisco, Toledo, Toronto.

There's a Good Reason

WHY

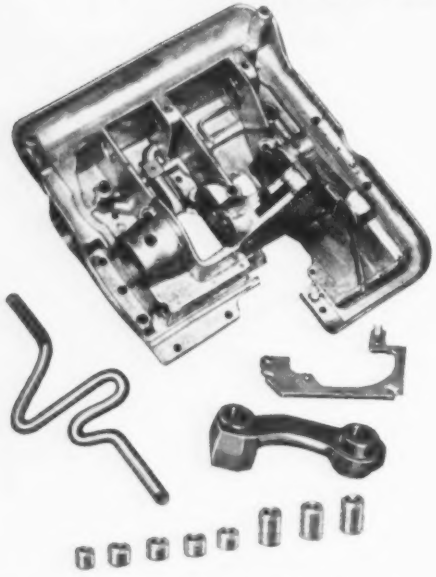
ZINC DIE CASTINGS

are so widely used –



at WILLCOX & GIBBS

it's COMPLEXITY



With eight knurled and threaded steel bushings, a steel bracket, a large, double, bearing frame, and a copper tube cast into the top frame as inserts, this is probably one of the most complicated ZINC Die Castings ever to come out of a die caster's shop. The result is COMPLEXITY with a purpose, and ZINC Die Casting takes complexity for granted.

This unbelievable complexity of shape was readily achieved in this sewing machine top frame through a single ZINC Die Casting. Willcox & Gibbs engineers incorporated features which would support dozens of critical parts to operate a mechanism moving at 5,500 rpm with incredibly fast starts and stops—and without vibration.

This rugged commercial sewing machine has to meet high performance demands for seaming, hemming, edging and serging operations at lightning-fast speeds—day-in, day-out utility—for fifteen years and more. Only ZINC Die Casting could provide these exacting requirements.

All sides of this top frame have numerous cored openings (the cores being pulled in four directions) that simplify assembly and help to make the "Superlock" sewing machine so efficient. There are many advantages in this ZINC Die Casting that may provide answers to some of your production problems. Send for our free folder "Zinc Die Castings" and then see a commercial die caster.

THE NEW JERSEY ZINC COMPANY 160 Front Street, New York 38, N. Y.

The research was done and the Zamak die casting alloys were developed with

HORSE HEAD SPECIAL (99.99 + % Uniform Quality)

ZINC FOR DIE CASTING ALLOYS

Automotive Production

WEEK ENDING		CARS	TRUCKS
Sept. 21,	1957*	52,141	13,054
Sept. 14,	1957	85,816	16,777
Sept. 22,	1956	35,652	14,170
Sept. 15,	1956	63,798	20,076
TO DATE	1957	4,619,983	804,114
TO DATE	1956	4,191,346	821,317

*Preliminary Source: Ward's Reports

bon steel in the finished vehicle, or 1.12 tons. The auto industry then has used about seven million tons.

Other Ferrous Metals—Plain cast iron is the next most heavily used item at 370 lbs per car. This figures out to just short of 1.25 million tons. Alloy cast iron accounts for 195 lbs of weight, or nearly 625,000 tons for the industry.

Alloy steel in the car is 159 lb. Industry consumption, then, is around 500,000 tons for the model year. About 200,000 tons of malleable cast iron are used, based on the 71 lb found in this car. Almost 250,000 tons of aluminum were used in the past year; the representative car had nearly 78 lb in it.

Total Picture—There are 45 lb of copper, brass and bronze; 28.5 lb of lead; and about 16 lb of zinc in the car. These roughly figure out to 125,000, 93,000 and 49,500 tons respectively. The 330 lb of miscellaneous materials that find their way into the car—glass, rubber, cloth, etc.—account for well over one million tons of business for non-metal industries.

Goggomobile: S-P's Small Car Bid?

What's all the "go, go, go" about at Studebaker-Packard's South Bend, Ind., plant?

In a preview of the 1958 S-P and Mercedes-Benz lines, Harold E. Churchill, S-P's president, mentioned a smaller car in the company's future. Little more was revealed by him other than "the matter of timing is very important for the car's introduction." He refused to say whether the car would be imported or manufactured in the U. S. The decision has not yet been made, he said.

West German Made—While Mr. Churchill was reluctant to say anything about the small car, THE IRON AGE was able to uncover additional information about S-P's small car plans.

The go, go, go is the Goggomobile. It is a small (even by European standards) four passenger car made in West Germany by Isaria Maschinenfabrik. With its 19 hp engine, the car is said to be capable of speeds up to 60 mph and top economy of 50 to 60 miles per gal.

U. S. Assembly Possible—Sources say several models will be offered, probably a two and four door sedan, and either a hardtop or convertible model.

It is known that S-P is shopping around for bids on stampings and other parts that could lead to assembly in the U. S.

Spring Introduction? — This would mean importing the assembled car, at least for the present. If studies show it practical to build the cars here, a switch could then be made. And it will give the company an idea of how well the car goes over before making expensive tooling commitments.

A good bet: The Goggomobile will be offered to U. S. car buyers through S-P outlets by next spring.

Small Car Sales Up

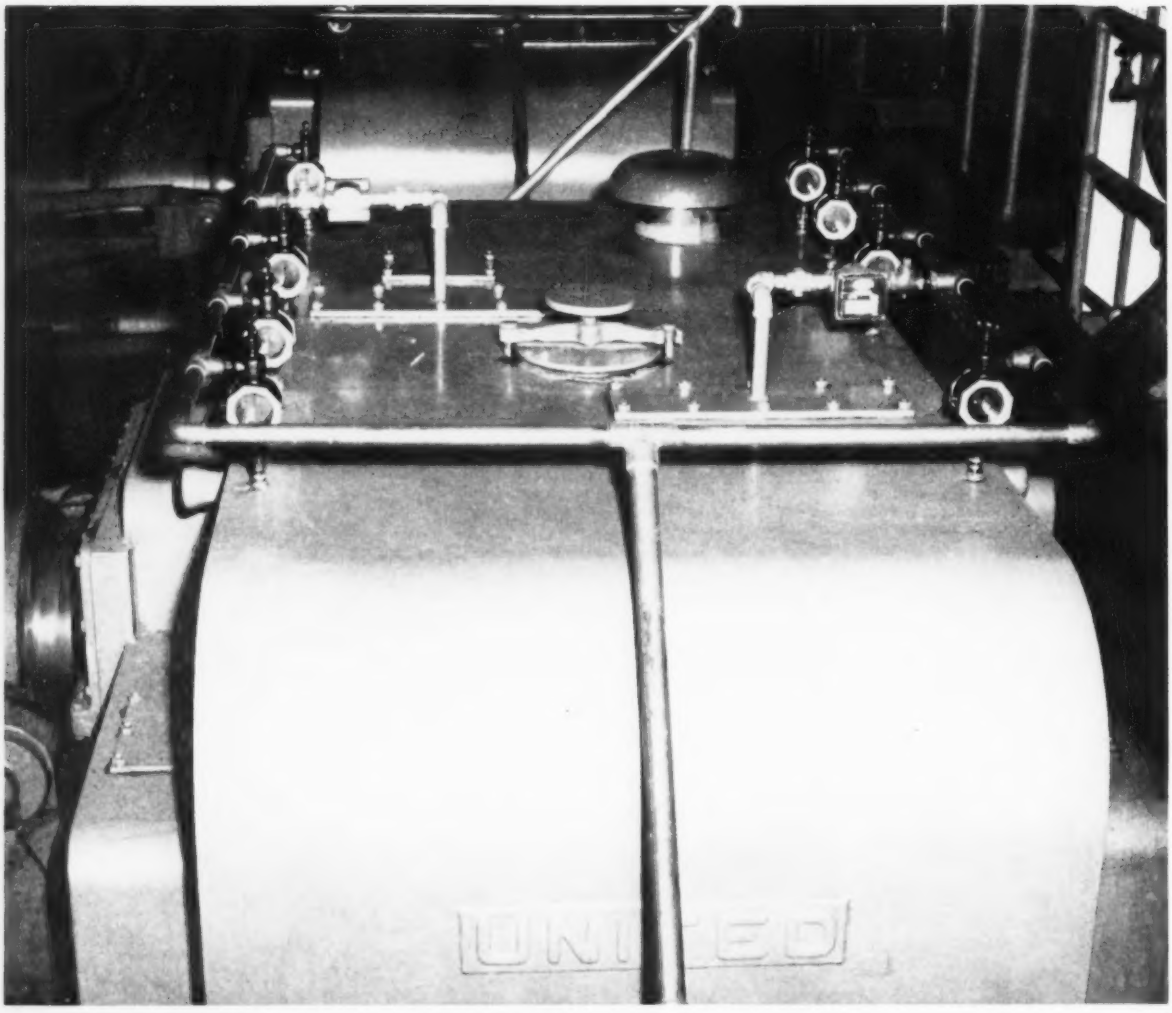
The foreign car sales boom continues along its merry way in the U. S. Seven months registration figures show 103,659 of the mostly small cars have been purchased this year. It is nearly 100 pct. greater than the same period last year when 52,014 sales were tallied through July.

Volkswagen still leads with 36,331 units for 35 pct of the foreign car market, but its share has been sliced. A year ago sales of 29,641 units amounted to 57 pct of the market. Surprise entry is the French-built Renault with 9.9 pct of the market on 10,309 registrations. Last year it didn't place among countable makes.

Other top sellers trail in this order: MG, 7959; British Ford, 7449; Metropolitan, 6473.

THE BULL OF THE WOODS By J. R. Williams

GOOD MORNING, FELLOWS!
HA-HA! THEM TWO OL' DUCKS LEARNED THEIR TRADE WHEN YOU HAD TO SERVE FOUR YEARS TO LEARN IT--AND THEY'RE HIGH-HATTIN' THAT GUY BECAUSE HE LEARNED HIS IN A SCHOOL WHERE THEY TEACH IT TO YOU IN FOUR MONTHS!
WELL, I THINK IF HE LEARNED IN FOUR MONTHS WHAT IT TOOK THEM FOUR YEARS TO LEARN, IT'S HIM THAT OUGHT TO BE HIGH-HATTIN' THEM!
THE SHOE ON THE WRONG FOOT
J.R.WILLIAMS



How Texaco Meropa Protects Gear Drives Against Heavier Loads, Higher Speeds

The trend toward heavier loading and higher speeds means increased output at lower unit cost, but it calls for greater attention to lubrication needs. *Texaco Meropa Lubricants*, for example, designed for severe service conditions, are extreme pressure lubricants that cushion metal surfaces against wear, allow gears to operate smoothly. Special polar additives in *Meropa* effectively maintain a protective oil film during heavy shock loads.

There is a full line of *Texaco Meropa Lubricants*, whose high load carrying capacity exceeds all requirements of main drive units, and other steel mill machinery. Let an experienced Texaco Lubrication Engineer suggest the best ones for your conditions. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

☆ ☆ ☆

The Texas Company, 135 East 42nd Street, New York 17, New York.

TEXACO

TEXACO Meropa Lubricants

FOR STEEL MILL GEAR DRIVES

Depreciation Study Progresses

Bulletin F Revision May Come Next Spring

If your business was one of those contributing suggestions to Bulletin F revision, you should be encouraged by its progress.

Study group is meeting regularly and has made visits to plant sites for on-the-spot investigation—By G. H. Baker.

▪ Tentative revisions in the government's Bulletin F, the table of suggested useful lives for depreciable equipment, are now being made.

The Internal Revenue Service's special advisory group working on the Bulletin F revision is meeting weekly and adopting tentative new depreciation schedules for machinery and equipment.

Wait for Spring—Final version of the revised Bulletin F probably won't be published until next spring, IRS officials say. The advisory group, consisting of IRS officials and industry experts, plans to complete its proposals by the end of this year, and submit them to the Treasury Department for review and approval.

There is little likelihood that any further comments will be solicited from industry. Some 150 replies to the IRS invitation for suggested changes in the 10-year-old schedule have been received. The response is considered "pretty good," although some industries have not replied at all, and "that's disappointing," a spokesman says.

Go to Source — The original deadline for comments was extended 60 days to Sept. 30, but replies are still coming in. A spokesman says these replies are being considered, and some industries who have engaged in extensive research before making their suggestions will still be permitted to file them.

The advisory committee has met with a few groups which requested time to present more detailed information. In addition, the group has visited plants to view new machinery and new processes. Automobile plants were among those visited.

The Purpose—Suggestions for dealing with the useful lives have been received from IRS field offices, as well as other government agencies, including the U. S. Commerce Department.

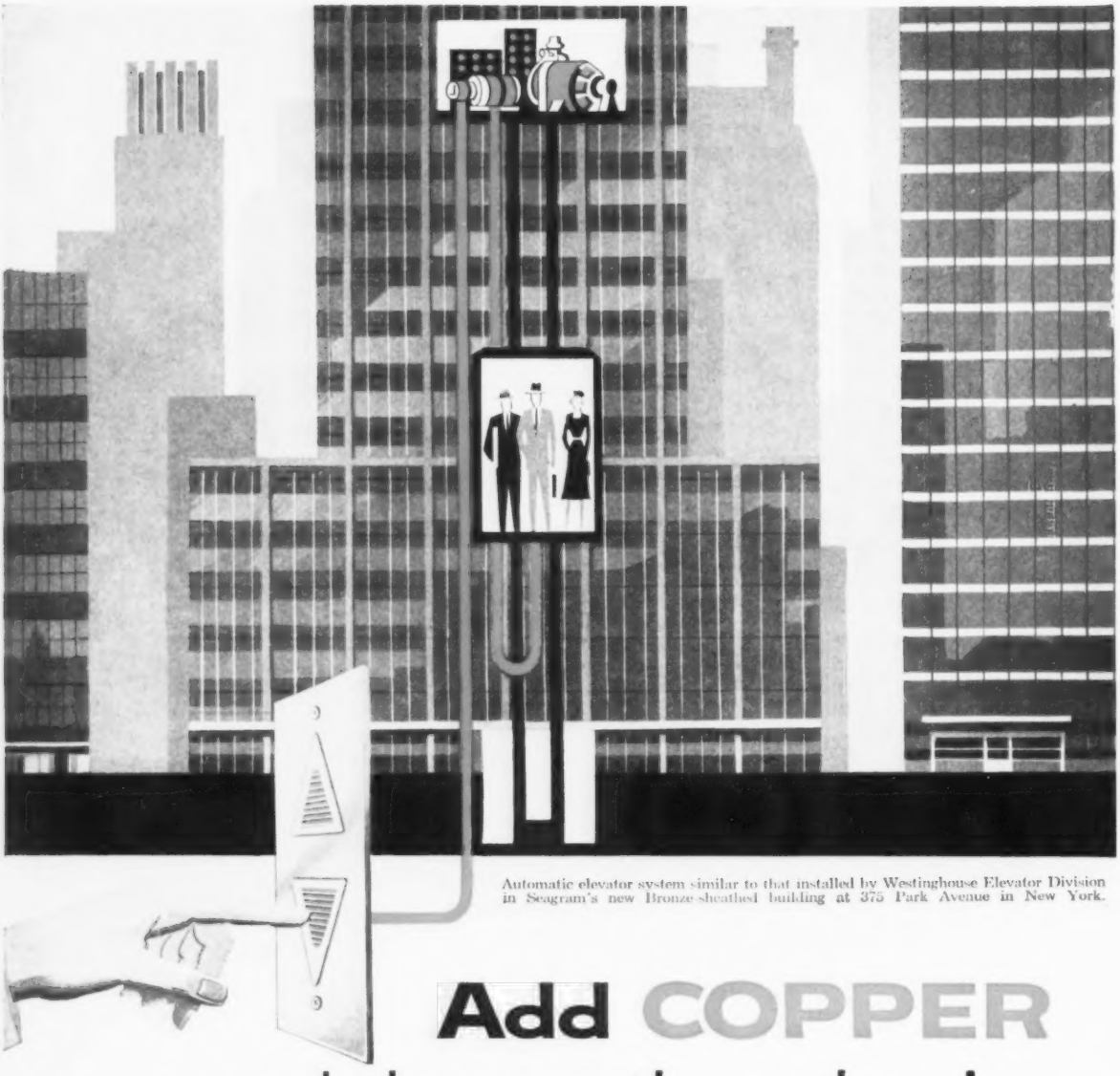
Purpose of the revision is to bring Bulletin F schedules up to date with modern production processes and machinery technology, and to recognize that some machinery becomes obsolete long before it is mechanically worn out.

The useful lives listed in the new Bulletin F will not be mandatory depreciation schedules, but any wide variations by a firm will probably have to be justified to the tax collectors.

In any case, they should be an improvement over the outmoded schedules that now restrict capital spending.

How Long Will These Smiles Last?

NOT SO HEIR-APPARENT: Chances of Jimmy Hoffa, right, succeeding Dave Beck as president of the Teamsters, exploded when the pair were censored by the Ethical Practices Committee of the AFL-CIO. Teamsters were virtually told to dump Hoffa or face expulsion from the AFL.



Automatic elevator system similar to that installed by Westinghouse Elevator Division in Seagram's new Bronze-sheathed building at 375 Park Avenue in New York.

Add COPPER

... and they run themselves!

Elevators, the newest automatic ones, show you some of the electronic marvels made possible by Copper. (If it's electronic, there's usually Copper in it.)

Because *Copper* conveys the electrical impulses to transmit signals, elevators are dispatched automatically to where they are needed, skip floors when there is no more room, close their doors politely and safely, never give passengers "that sinking feeling."

When you step in, Copper enables a phantom voice to warn: "Stand back from the door, please." In a department store, the voice says: "This car down," even announces the merchandise on each floor. In a hotel, it calls out the floors.

Copper "nerves" enable control mechanisms to "think," so elevators are returned to the first floor at night, lights are turned out, motor-generator equipment shut down to save power.

America's electronic future will require Copper . . . and the Copper Industry will see to it that an ample supply is maintained to meet the need as it arises.

DO YOU MANUFACTURE ELECTRONIC COMPONENTS? You'll find Copper a highly "workable" material. Makes the most complicated shapes relatively easy to produce, reduces cost. Reduces product-bulk, too, through printed circuits and other miniaturization. And gives you an extra dividend in high-cash-recovery scrap!

COPPER • BRASS • BRONZE

in over 40 Standard Alloys!

For data on Copper in other electronic applications, write to the Copper and Brass Research Association, 420 Lexington Ave, New York 17, N. Y.

Steel Shares Natural Gas Boom

Expansion Makes It Good Product Market

New plants and pipelines will result in a 10-year spending of nearly $19 billion, it's predicted.

One project, slated for operation in 1960, is 1300-mile Canada-to-California gas line. —By R. R. Kay.

▪ Makers of steel and steel products can count on continuing strong sales to the natural gas industry. The next decade should see steel purchases by that industry bound upward. And a big part of the growth will come from Farwestern natural gas developments.

"The nation's gas utility and pipeline industry expects unprecedented growth in the 10-year period extending to 1965. Expenditures of nearly $19 billion for new construction are predicted for this second postwar decade. Gross plant in service by 1965 will be more than double the industry's present investment." That's the word from Norman R. Sutherland, president and general manager, Pacific Gas and Electric Co.

California Story—To meet the growing energy needs in California, alone, another large pipeline is in the works. PG&E has placed an order for 550,000 tons of 36-in. diam steel pipe. It's for a new transmission system.

Non-Marine Work Aids Bethlehem Shipyard

Bethlehem Steel Co.'s San Francisco shipyard, out to avoid some of the feast or famine living connected with shipbuilding, is making a bigger-than-ever pitch for other industrial work.

The company is finishing up a $10 million modernization program. And it now has one of the best-equipped, privately-owned machine shops on the West Coast.

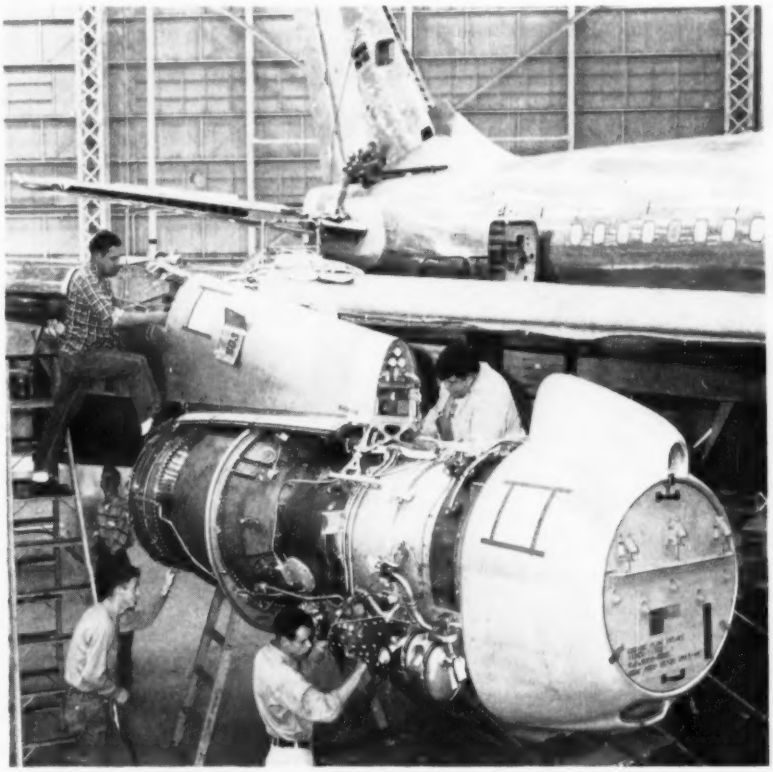
Out After More—T. C. Ingersoll, general manager of Bethlehem's Shipbuilding Div., says that the San Francisco yard's non-marine work is running about 12 pct of the total dollar volume. Goal: 20 pct to 25 pct.

Industrial jobs are nothing new at the yard, Mr. Ingersoll points out. "We've done such work since the early days when we made mining machinery." But the new facilities make possible a larger variety.

Doesn't this put Bethlehem in direct competition with some of its good steel-using customers? "We're in competition with everybody," Mr. Ingersoll admits. "But the things we do most of the others can't do—or they can only do a small part."

Some of Bethlehem's non-marine customers are Pacific Gas and Electric, and the AEC.

First of a Long Family Line



STRICTLY COMMERCIAL: Engines in place and tail surface installed, first of Boeing's commercial jet transports nears completion at firm's Renton, Wash., plant. It's initial one of 151 ordered by 13 airlines.

BROWN & SHARPE standard design of the No. 11 Face Grinder provides all basic features needed for FULL AUTOMATION at Thompson Products

NO. 11 FACE GRINDING MACHINE is used in a fully automated production line, between centerless grinding and polishing operations.

OPERATION is grinding one face of cylindrical parts for automobile power steering assemblies.

AUTOMATIC CYCLES and work-handling equipment eliminate manual operations. Grinding, wheel-dressing, work loading and unloading are fully automatic. Machine stops automatically, when minimum usable diameter of grinding wheel is reached, for replacement of the wheel by the operator.

SPECIAL TRANSFER ARM has two chambers, swings down to unload finished part into one chamber, and load chuck with unground part from other. At top of travel, the arm ejects finished part into track to next operation, and loads unground part, for transfer to chuck. Chuck is flushed with filtered coolant after each unloading.

AUTOMATIC PRESET GRINDING CYCLE includes rapid advance, wheel feed, spark out, and rapid retraction.

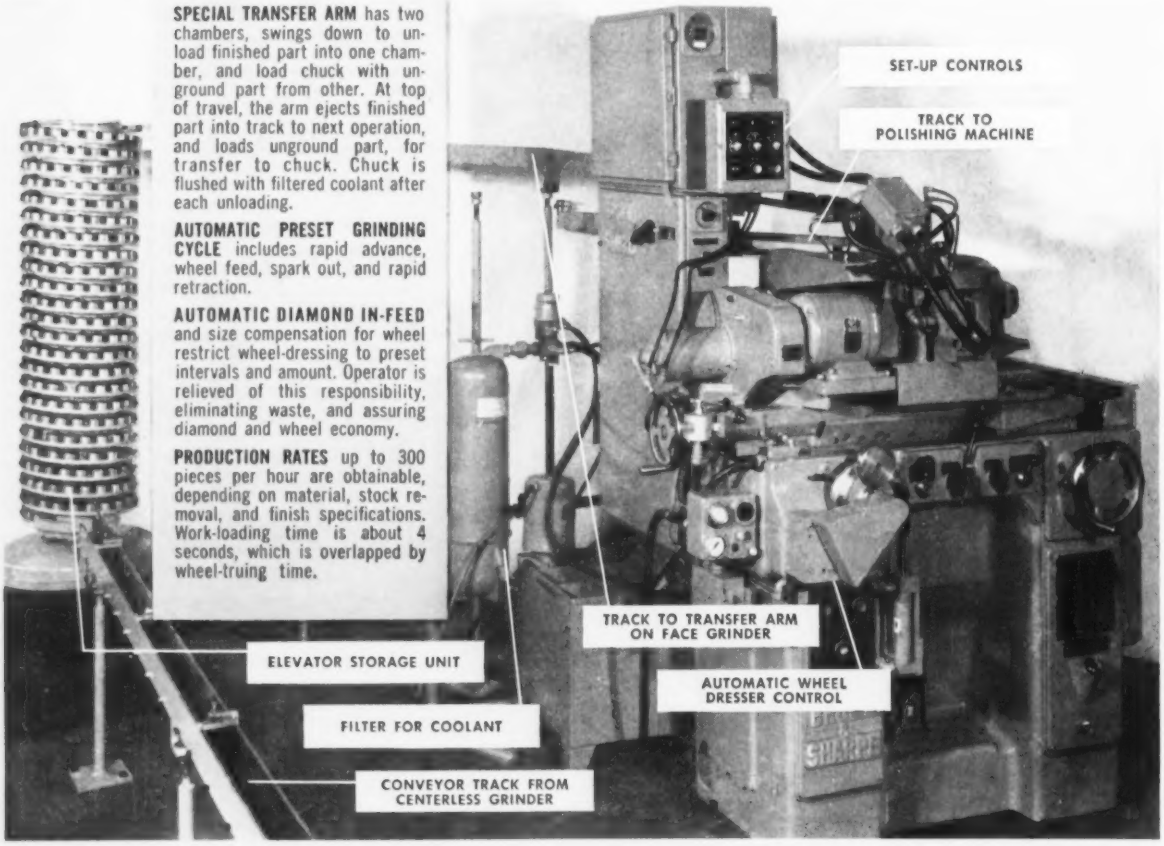
AUTOMATIC DIAMOND IN-FEED and size compensation for wheel restrict wheel-dressing to preset intervals and amount. Operator is relieved of this responsibility, eliminating waste, and assuring diamond and wheel economy.

PRODUCTION RATES up to 300 pieces per hour are obtainable, depending on material, stock removal, and finish specifications. Work-loading time is about 4 seconds, which is overlapped by wheel-truing time.

Rapid and costly obsolescence of special machines can be avoided when you start with a *standard* machine that permits designing for any degree of automatic operation.

At Thompson Products, the No. 11 Face Grinding Machine, completely automated with the addition of special automatic cycles and work-handling equipment, meets full production demands for power steering parts used by a leading automobile manufacturer.

If specifications should be changed, or if the part is eliminated, the machine can be reconverted for revised special requirements, or for standard operations, without major expense.


SET-UP CONTROLS
TRACK TO POLISHING MACHINE
TRACK TO TRANSFER ARM ON FACE GRINDER
AUTOMATIC WHEEL DRESSER CONTROL
ELEVATOR STORAGE UNIT
FILTER FOR COOLANT
CONVEYOR TRACK FROM CENTERLESS GRINDER

The No. 11 Face Grinder without special equipment is setting new production records on a wide range of face grinding jobs — employing only the standard features which permit a semi-automatic grinding cycle and preset wheel dressing control. Find out how it can lower your costs.

Brown & Sharpe design specialists will survey your grinding operations at your request. Let them show you how to make your machine investment pay the highest return . . . in productivity, in lasting economy. Write: Brown & Sharpe Mfg. Co., Providence 1, R. I.

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Defense Dept. Studies Ford Plan

Builders Are Cool to Building-Block Theory

Defense Dept. officials take a long look at Ford engineers' building-block machine tool theory for mobilization planning.

It might save a lot of time and motion, but builders have their reservations. Study is planned.—By E. J. Egan, Jr.

■ Building-block machine tool concepts may bring some drastic revisions in the government's long-range production planning.

Washington's interest in building-block techniques perked up sharply following a recent Pentagon meeting between mobilization officials and Ford Motor Co. engineers, D. C. Pippel and Henry Daum.

Ford Theory—Mr. Pippel directs mobilization planning and defense sales at Ford. He outlined for government planners why his firm believes the building-block principle is inevitable for big-volume machining at lower costs.

And Mr. Daum, who manages Ford's Machine Process Dept. (Mfg. Engineering Office), showed his government audience what he considers key points in the building-block idea.

Twenty-Year Plan—Essentially, in a transfer-machining setup, beds and columns would be permanent items, along with certain transfer devices. Thus, to accommodate design changes in a particular product category, only the machining heads and tools would have to be changed.

The Ford men pointed out that their first automated machining line, built in 1951, was supposed to be good for 15 to 20 years. But the company has already been forced to tear it up. It is Ford's firm belief that a permanent, building-block line could easily last 20 years, and that any new tooling costs would be reduced greatly.

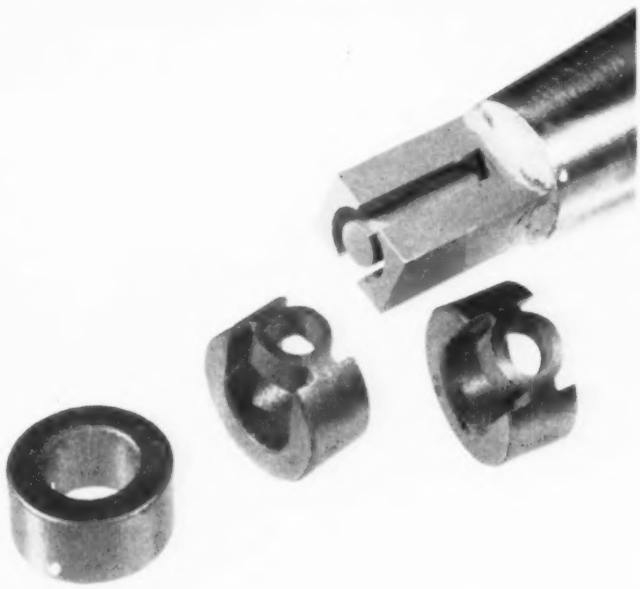
Food for Study—Where does the mobilization value of this concept fit in? The Ford engineers emphasize that auto makers, for example, could produce tanks, tank engines, aircraft engines and other war machines in this manner, and with a minimum of cost and waste motion.

Defense Dept. officials and mobilization planners seemed impressed by the Ford presentation. They've called on the Metalworking Equipment Div., Business & Defense Services Administration, U. S. Dept. of Commerce, to study possible building-block applications.

Builders Cool—Niels A. Olsen, MED's deputy director, told THE IRON AGE, "This will be a joint study, with executives from both the machine tool industry and the government taking part. We'll need all the help we can get, as this is clearly one of the biggest tool proposals to come before the government in many years."

Many builders are known to be cool toward building-block ideas.

Tough Jobs Yield to Ultrasonic Machining



HARD AND BRITTLE: Even diamond tools broke trying to put a hole in the rim of this ferrite reactor core. Ultrasonic machining with the Cavitron tool shown here handled the job with ease. (Sheffield Corp. photo)

INDUSTRIAL BRIEFS

Add Manganese—Electro Metallurgical Co. has completed new production facilities at Alloy, W. Va., to meet increasing demand for Mantemp exothermic ferromanganese. This product is specially designed for ladle additions of one to two pct manganese in open-hearth steel production.

Honors Due—American Institute of Mining, Metallurgical and Petroleum Engineers has awarded its Robert H. Richards award for 1958 to Fred D. De Vaney, chief metallurgist, Pickands Mather & Co.; the Benjamin F. Fairless Award to Hjalmar W. Johnson, vice president, steel manufacturing, Inland Steel Co. Presentations will be at the annual banquet of AIME.

Double Duty—Metals & Controls Corp. will expand its thermostat manufacturing facilities to meet increased demand for appliance controls. Production capacity will be doubled when the expansion program is completed at the Versailles, Ky. plant. Further expansion of the company's Attleboro, Mass., plant will be announced.

Flying Start—Ryan Aeronautical Co. has placed in service a new, half-million dollar Engineering and Research Center. The two-story structure is located at the west end of Ryan's Lindberg Field plant, San Diego, Calif. Virtually all of Ryan's engineering, research and development work, which has been scattered in various locations of the plant, will be concentrated in the new facility.

Sweet Louise—The S. S. Louise, newest addition to the bauxite ore-carrying fleet of the Caribbean Steamship Co., an affiliate of Reynolds Metals Co., has arrived at Corpus Christi on its first regular run between Jamaica and the port. The $5 million ship is one of four carriers now operating on the run, bringing in more than 50,000 tons of ore every 10 days.

Inter Industry Cooperation—Sharon Steel Corp. has organized a new Product Development and Sales Research Dept. to work closely with the automotive manufacturers on development and use of new super alloy steels in the auto industry. The department will keep industry informed of Sharon's research developments with new metal.

IRON AGE Scoop—A major French steel producer, the Societe Lorraine de Laminage Continu (Sollac) is the first firm outside Sweden to be licensed to use the Stora Kal-Do process, a new steelmaking method now being investigated by American steelmaking interests. The process, based on the use of a rotary oxygen converter, was developed by Stora Kopparbergs Bergslag A/B of Sweden. (IRON AGE Oct. 18, 1956)

Less Confusion—Two new trade names, Stercon and Stervac, have been adopted by Firth Sterling Inc., to clarify the difference between consumable electrode vacuum melted alloys and induction vacuum melted alloys. Stercon designates the former, Stervac the latter.

Safety First, Second and Third—Twenty operations of Bethlehem Steel have been named award winners by the National Safety Council for the year ended June, 1957. Heading the list is the Sparrows Point steel plant, which won first place among 19 major steel producing plants. In second place in this contest was the company's Bethlehem plant and in third place the plant at Johnstown. In the previous contest, 18 Bethlehem operations won similar awards. It is the 15th consecutive year in which a Bethlehem plant won first place in the large steel plant class.

Big and New—Garrett of Philadelphia, makers of washers, fasteners, springs, stampings and assemblies, is now located at a new plant at Torresdale Ave. at Tolbut St., Philadelphia. The new one-story plant, covers 280,000 sq ft.

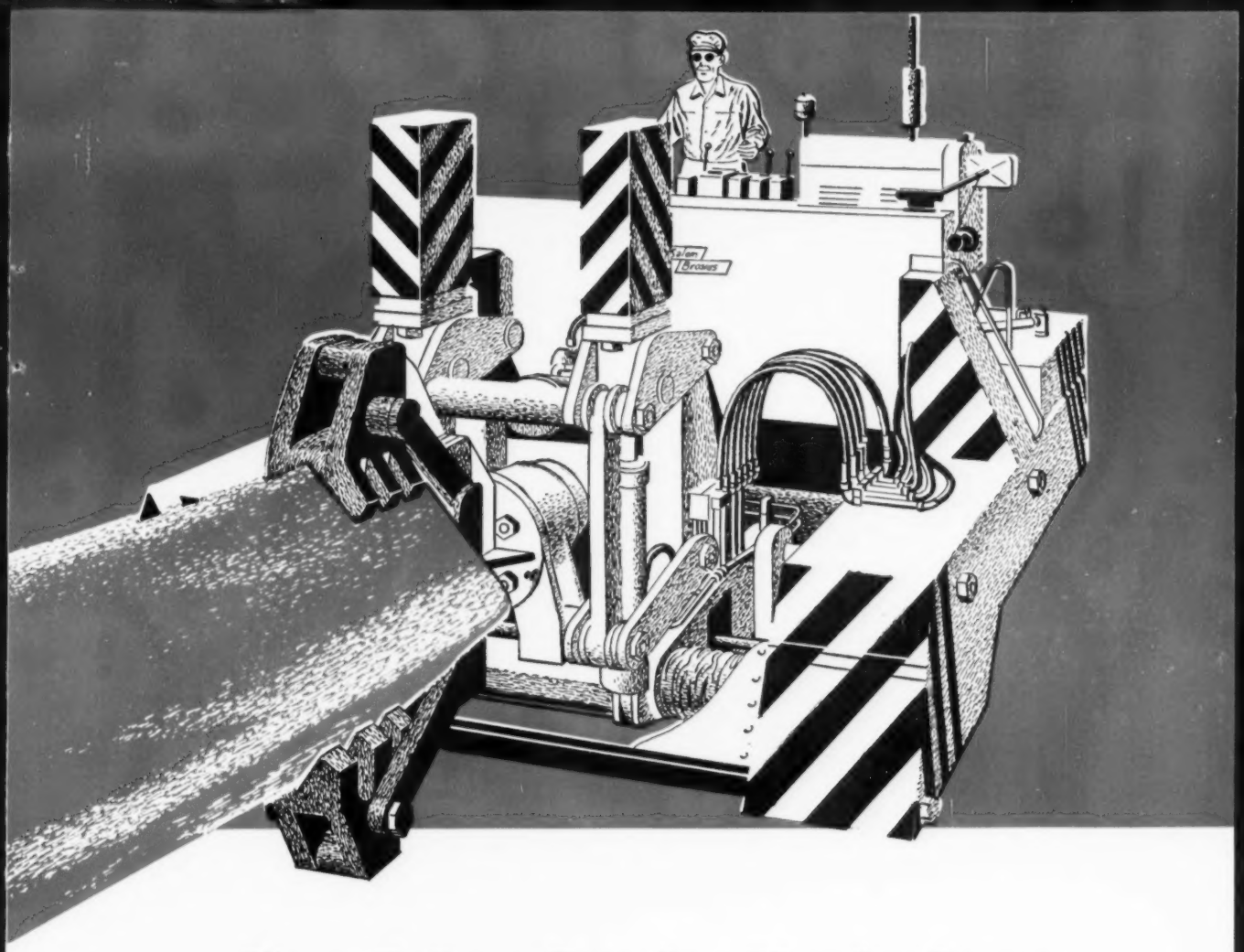
Major Move—De Vleig Machine Co. has started construction of a new plant in Royal Oak, Mich. to house the company's Jigmil operation, which has been located in nearby Ferndale since 1940. The 130,000-sq ft plant will be completed by June 1, 1958.

Fresh Frozen—Pacific Fruit Express Co. will build 1000 mechanical refrigerator cars at a cost of $20 million. They will be constructed in the shops of the PFE, jointly owned by the Southern Pacific and Union Pacific railroads. The cars will carry frozen foods at sub-freezing temperatures.

With a Bang—Dow Chemical Co. will enter the linear polyethylene field with construction of a multi - million - dollar production plant at the company's Bay City, Mich., division. The plant is scheduled for completion in October, 1958.

Four of a Kind—Four identical 3750-kva sealed dry-type transformers have been purchased by Inland Steel Co. from General Electric. They are believed to be the largest three-phase sealed units ever manufactured. The units will supply in-plant power for Inland's Indiana Harbor works. Each unit weighs more than 18 tons.

"His production increases 75 pct when he has an audience."



New Salem–Brosius Manipulator

adds speed, safety and economy to heavy forging

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This new machine, with its greater mass, new shock absorbing principles, heavier construction, and a new and superior hydraulic system, offers long, trouble-free service, low-cost maintenance, and increased finished forging production.

At hammer or press it raises, lowers, tilts, rotates or laterally moves the hot stock, satisfying handling requirements. Also, it can charge or draw forge shop furnaces, and operate with the facility of a fork-lift truck in billet handling. Call for a visit from a Salem-Brosius forging expert to show you how you can benefit from the use of this manipulator. There is no obligation.

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OR13

L. B. Warren, elected director, Chrysler Corp., Detroit.

W. E. Grace, elected executive vice president, Fruehauf Trailer Co., Detroit.

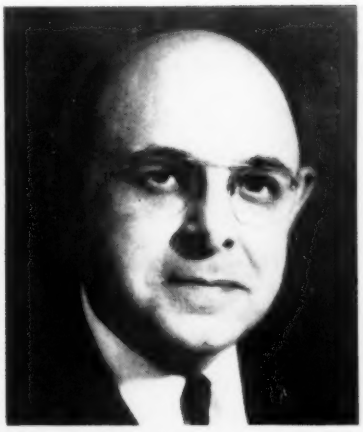
C. C. Tillinghast, Jr., named director and vice president, foreign investments and plants, Bendix Aviation Corp., Detroit.

Dr. M. A. Miller, appointed chief, Foil and Packaging Div., Aluminum Co. Of America research laboratories, New Kensington, Pa.

T. A. Haller, named director, J. I. Case Co. research and development center, Racine, Wis.

W. C. Denison, elected vice president, American Brake Shoe Co., New York.

A. B. McKee, named assistant chief, Foil and Packaging Div., Aluminum Co. of America research laboratories, New Kensington, Pa.



R. R. Rhodehamel, elected vice president and general sales manager, National Acme Co., Cleveland.

D. F. Adams, named general sales manager, Colson Corp., Elyria, O.

A. H. Clarke, named vice president-manufacturing, Crouse-Hinds Co., Syracuse, N. Y.; **R. P. Northup,** named vice president-engineering.

S. B. Fuerst, named consultant-manufacturing engineering research, manufacturing engineering service, General Electric Co., Schenectady, N. Y.

W. L. Kennicott, elected vice president, Kennametal, Inc., Latrobe, Pa.

K. M. Kiel, appointed manager, new product development, Defense Sales Div., Burroughs Corp., Detroit, Mich.

K. H. Meyer, appointed director of engineering, C. B. Hunt & Son, Inc., Salem, O.

J. M. Patterson, named sales manager, The Beryllium Corp., Reading, Pa.

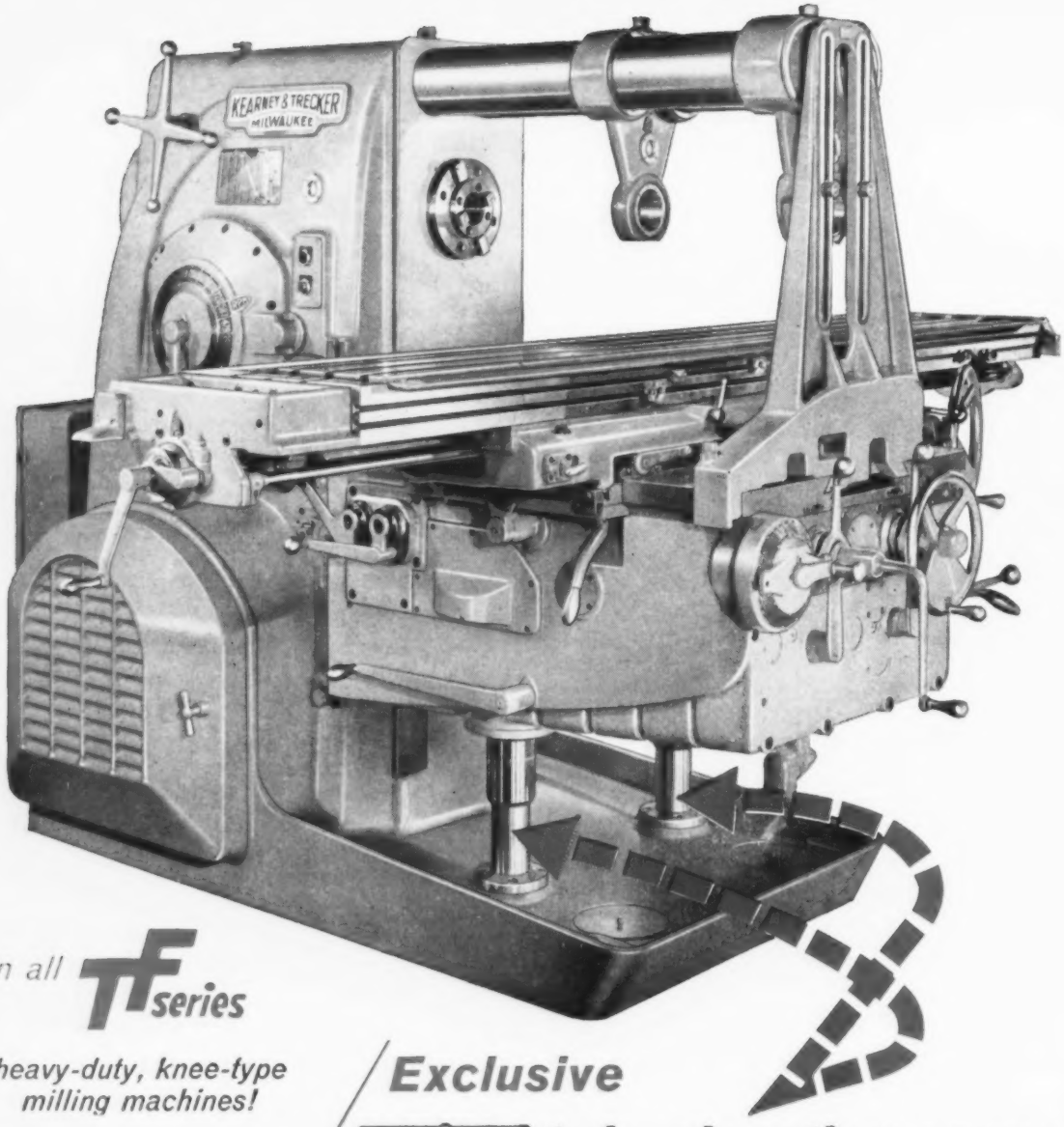
N. J. Kassnel, appointed sales manager, Cleveland district, Verson Allsteel Press Co., Chicago.

W. W. Blauvelt, named director, Business Planning and Control Div., The Thew Shovel Co., Lorain, O.

H. C. Wallace, named southern regional sales manager, Air Reduction Sales Co., New York.

K. G. Weinstein, Calumet Iron & Supply Co., elected president of the Chicago chapter, Institute of Scrap Iron & Steel. Other officers elected were: **Laurence Kaplan** of M. S. Kaplan Co., **C. A. Mogilner,** of Apex Steel Co., and **J. B. Schlossberg** of Lipsett Steel Products Co., vice presidents; **Fred Gordon,** Iroquois Iron & Metal Co., treasurer; **Julius Bogolub,** A-1 Pipe & Coupling Co., secretary.

J. J. Bollinger, named sales representative, midwestern region, Cru-



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cible Steel Co. of America, Spring Div., Pittsburgh.

The following appointments are within the Houston plant, Sheffield Div., Armco Steel Corp.: **A. O. Leweke,** works industrial engineer; **G. W. Brooks,** works metallurgist; **C. H. Bone,** processing analyst; **H. H. Olson,** assistant works metallurgist; **G. C. Stanley,** supervisor of employment; **H. A. Marshall,** industrial relations superintendent; **V. F. Herbster,** assistant superintendent, rolling mills.

J. H. Charpentier, appointed sales manager, Machinery Div., Fenn Manufacturing Co., Newington, Conn.

W. J. Allaback, elected vice president and director, Byers Machine, Inc., Ravenna, O.; **H. G. Dehnel,** appointed manager.

L. O. Voldahl, named systems and procedures manager, Plymouth Div., Chrysler Corp.; **J. D. Robson,** appointed director-personnel.

Art Shelton, appointed Chicago regional manager, Coles Cranes, Inc., Joliet, Ill.

F. J. Newman, appointed marketing manager, Process Instruments Div., Beckman Instruments, Inc., Fullerton, Calif.

J. J. Wiest, appointed technical director, locknut dept., Standard Pressed Steel Co., Jenkintown, Pa.

I. W. Pitman, appointed sales engineer, Fabricated Steel Service, Inc., North Hollywood, Calif.

G. W. Straub, sales representative, Container Div., Jones & Laughlin Steel Corp.

G. H. Riddle, sales engineer, rails and track accessories, Bethlehem Steel Corp., Bethlehem, Pa.

N. W. Blakely, named asst. general manager, Benwood (W. Va.) Works, Wheeling Steel Corp.

D. S. Kaplinger, appointed New England sales representative, Electrical Contact Div., Fansteel Metallurgical Corp., Wethersfield, Conn.

F. E. Cooper, appointed purchasing agent, Montebello Fabricating Div., Kaiser Steel Corp.

H. S. Ritterson, appointed sales engineer, Gates Engineering Co., Wilmington, Del.

Don Palmisano, named customer sales representative, Kansas City, Mo., office, Electrode Div., Great Lakes Carbon Corp.

W. E. Cashen, appointed sales representative, Midwest, Air Impeller Div., The Torrington Mfg. Co., Torrington, Conn.

H. H. Carlson, named industrial hydraulics application engineer, Cincinnati, O., office, Vickers Inc.

A. H. Branstad, named manager of sheet and plate, Kaiser Aluminum & Chemical Corp., Oakland, Calif.

R. G. Atkins, appointed manager, marketing dept., Whitney Chain Co. and Hanson-Whitney

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Div., Hartford, Conn.; **C. G. Green, Jr.,** named southwestern regional manager; **L. I. Fraser,** named Detroit district manager.

W. J. Snyder, named special sales representative, Tube Reducing Corp.

W. R. Post, appointed sales engineer, Empire Steel Castings, Inc., Reading, Pa.

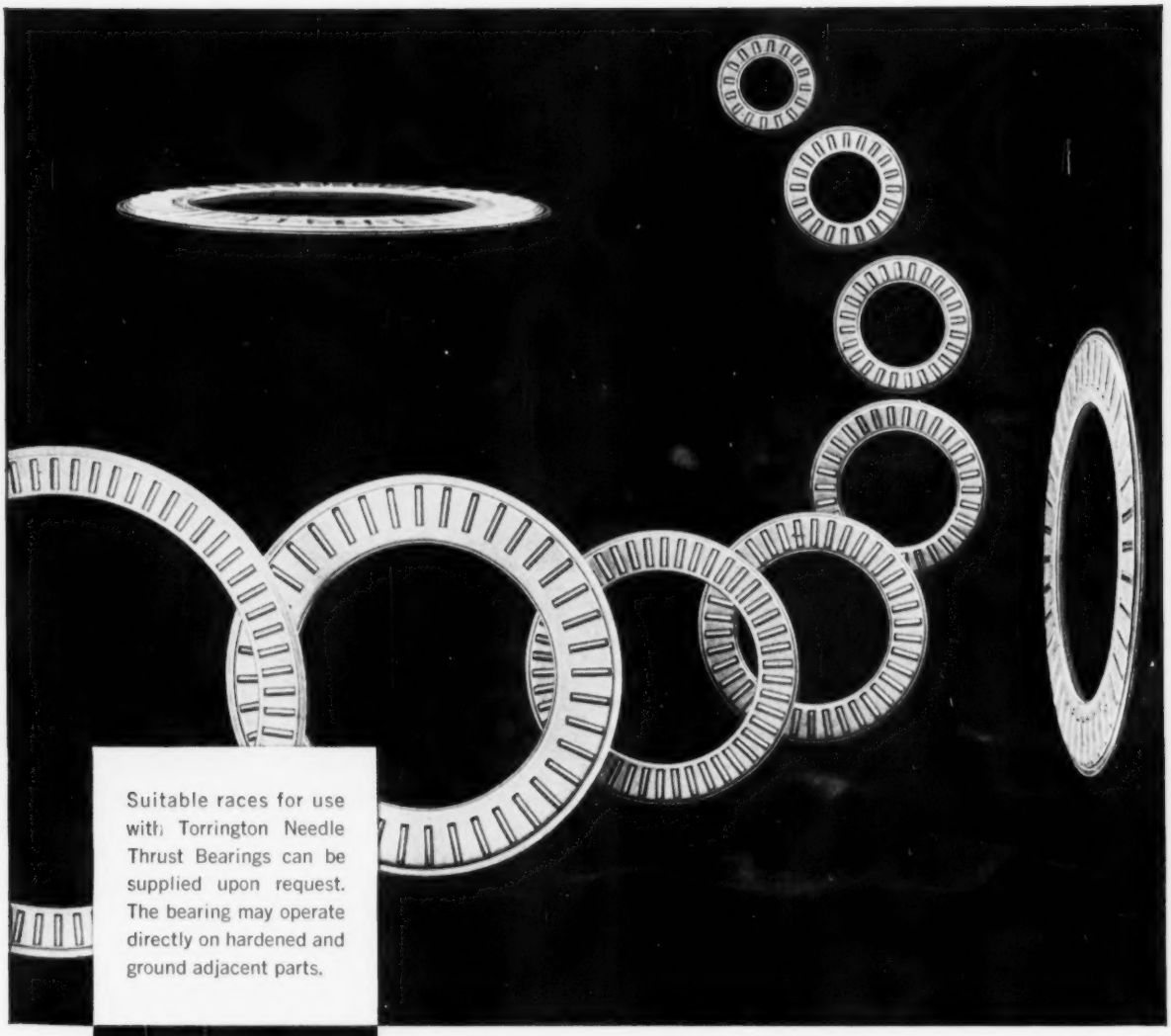
D. V. Cropsey, elected vice president - industrial divisions, Elgin National Watch Co., Elgin, Ill.

J. P. Stine, named manager, New York branch, Thor Power Tool Co., Chicago.

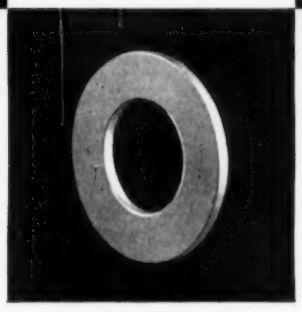
W. J. Edmunds, Jr., named manager of extrusions and forgings, Kaiser Aluminum & Chemical Corp., Oakland, Calif.

Fred Engelhardt, appointed director, purchases and traffic, A. M. Byers Co., Pittsburgh.

C. F. Farrell, appointed district



Suitable races for use with Torrington Needle Thrust Bearings can be supplied upon request. The bearing may operate directly on hardened and ground adjacent parts.



Torrington's new Needle Thrust Bearing grows in popularity...and range of sizes

Designers have been quick to take advantage of the compactness, high thrust capacity and low unit cost of Torrington's new Needle Thrust Bearing.

To meet the growing demand for this bearing in automatic transmissions, governors, steering gears, bevel gears, hydraulic pumps, torque converters and many other applications, tooling has been completed to produce bearings ranging from .500" ID to 3.000" ID.

Only .0781" thick, the Torrington Needle Thrust Bearing is thin as an ordinary thrust washer, yet brings all the advantages of anti-friction operation to applications where space is limited. Mating steel retainer halves are joined securely to form a self-contained unit that is easy to handle and install.

Plan today to evaluate the Torrington Needle Thrust Bearing. Services of our Engineering Department are available to help you. For full information, write for Bulletin No. 16, "Torrington Needle Thrust Bearings." *The Torrington Company*, Torrington, Conn.—and South Bend 21, Ind.

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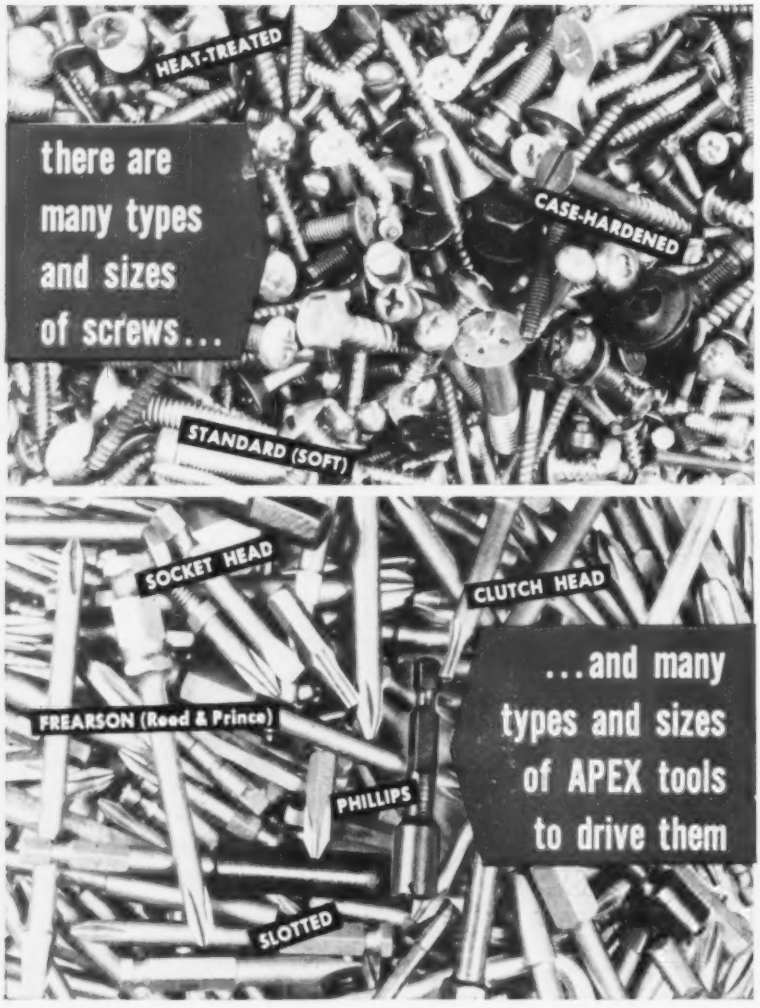

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If you drive Phillips, Frearson (Reed & Prince), Slotted, Clutch Head or Socket Head screws, you can reduce your fastening costs with Apex Screwdriving Tools. For complete information, write, on your company letterhead please, for Catalog 25 (Magnetic Tools) or Catalog 21 (Standard Tools).

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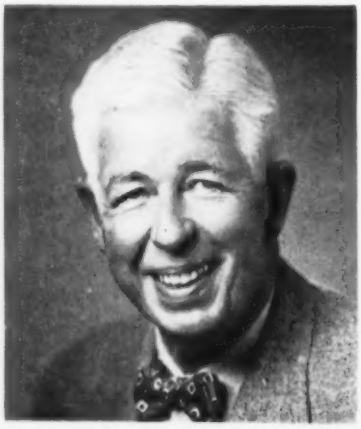
manager, Seattle, Edison Storage Battery Div., Thomas A. Edison Industries, West Orange, N. J.

H. S. Schweinsberg, named assistant general sales manager, Harbison-Walker Refractories Co., Pittsburgh.

W. H. Ashton, appointed director of raw materials, American Steel and Wire Div., U. S. Steel Corp., Cleveland.

R. L. Grunewald, appointed manager-manufacturing, gas turbine dept., General Electric Co., Schenectady, N. Y.

Claude Stiner, named treasurer, Tennessee Fabricating Co., Memphis.



A. W. Smythe, elected president, Byers Machine, Inc., Ravenna, O.

J. R. Allen, named Detroit district manager, Wallingford Steel Co., Wallingford, Conn.

H. A. Andresen and **J. C. Stateson,** named sales engineers, eastern district, Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.

R. B. McCarthy, appointed chief engineer, Steel Mill Div., Surface Combustion Corp.

W. C. Bullock, appointed staff engineer, G-L Electronics, Camden, N. J.

G. J. Stier, appointed industrial engineer, Leschen Wire Rope Div., H. K. Porter Co., Inc., St. Louis,

R. N. Haynes and **Terry Don-**

39th National Metal Exposition

Thousands of products will be displayed by more than 500 metalworking firms in the vast exhibit areas of Chicago's International Amphitheatre and Exposition Hall, Monday through Friday, November 4 to 8. 50,000 experts from the United Statees and the free world will meet with you.

2nd World Metallurgical Congress

Years of intensive effort have gone into this world event. Overseas scientists and engineers will attend from 38 countries of the free world. They will exchange ideas with you, present their own technical and practical papers.

You will want to be in Chicago the week of November 4.

You will want to hear these scientists and engineers from the whole, wide wonderful world of metals . . . outstanding metal men from the United States, Canada and the entire free world . . . more than 38 countries will be represented. You will want to listen, to discuss, to meet the men who are creating this world of metals.

You will want to be in Chicago to see the vast array of metalworking products and equipment that will be displayed by more than 500 leading firms at the Metal Show — the 39th National Metal Exposition — in the International Amphitheatre and Exposition Hall. This will be the greatest display of metals and metalworking equipment. Here, in one week, you will see more products, talk with more metalworking experts, than in a year of travel.

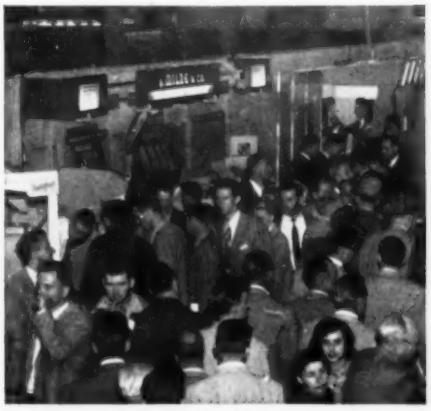


Exhibit Space Available

Hundreds of manufacturers have reserved Metal Show space, but there are good locations still available in the vast new exposition halls of the International Amphitheatre. If the metalproducing or metalworking industries are your market, don't miss this show — write for display information now.

You will want to be in Chicago with your associates from management, engineering, production and sales.This will be a world event you will long remember — and from which you will obtain ideas and knowledge to meet the metalworking problems of today and tomorrow. Make a date now — to be in Chicago, the week of November 4. For hotel reservations write: Metal Show Housing Bureau, c/o Chicago Convention Bureau, Inc. 134 N. LaSalle Street, Suite 900, Chicago 2, Illinois.

Cooperating Societies: Metals Division, American Institute of Mining, Metallurgical and Petroleum Engineers . . . the Society for Non Destructive Testing . . . the Industrial Heating Equipment Association.

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The Engineering Society for the Metal Industry

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Why only ORE BRIDGES at McLouth's Trenton Mill?

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This is not always the case. A plant that has only a few furnaces can realize substantial savings by building a dual-purpose machine to do the entire task. That's what McLouth did. At their Trenton, Michigan, mill these two modern Dravo bridges perform all functions —unloading, stocking and reclaiming ore and limestone.

Practical engineering assistance is available to help you solve problems or reduce costs in bulk materials handling or in any of the fields listed below. Write DRAVO CORPORATION, PITTSBURGH 25, PENNSYLVANIA.

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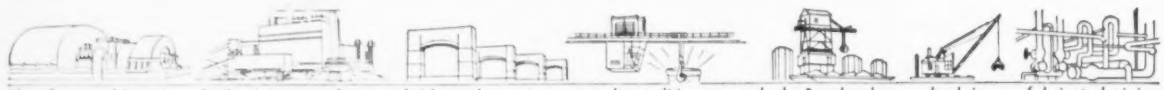

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nelly, appointed sales representatives, state of Michigan with the exception of Detroit, Sun Steel Co

J. W. Snyder, named stainless metallurgist, Sales Dept.'s Technical Service Staff, Universal-Cyclops Steel Corp., Bridgeville, Pa.

P. H. Spennetta, appointed director of engineering, Industrial Div., J. I. Case Co., Racine, Wis.

W. E. Spieth, named master mechanic, Coote & Jorgensen, Ltd., Australian subsidiary of Borg-Warner Corp.

W. C. Higdon, appointed works manager, Houston plant, Sheffield Div., Armco Steel Corp.

Stanley Marwin, appointed assistant works manager, Los Angeles plant, American Manganese Steel Div., American Brake Shoe Co.

R. E. Nelson, named manager, technical service department, American Brakeblok Div., American Brake Shoe Co.

OBITUARIES

W. E. Caldwell, 73, chairman of the board, The Cleveland Twist Drill Co.; **H. C. Hurtt,** asst. to the vice president, sales.

R. B. Elmendorf, 51, manager, marketing, Conduit Products Dept., General Electric Co., Bridgeport, Conn.

Dr. C. C. Van Nuys, 79, retired chief physicist, Air Reduction Co., Inc.

Russell Duer, 58, district sales manager, Cincinnati, Wheelabrator Corp.

Isaac Black, 79, retired vice president and general manager of Russell & Erwin Div., The American Hardware Corp., New Britain, Conn.

Planning Heat Treating Mechanization?

A Mechanized Desanding Operation
This "jack-rabbit" mechanized salt bath line for electrolytic desanding of gray iron castings was designed and supplied in its entirety by Ajax.

. . . IT PAYS TO CONSULT AJAX ELECTRIC!

The extent of Ajax Electric experience in applying salt baths to specific heat treating problems is evident in the Ajax engineering of mechanized installations, large and small.

In hundreds of applications, complete heat treating cycles are handled automatically by conveyorized installations engineered from beginning to end by Ajax.

You get more than just salt baths from Ajax. You get complete heat treating know how . . . accurately *applied to your specific problem!*

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How Much Automation Can Small Plants Afford?

By **B. A. Willsey**—Plant Manager, Solar Aircraft Co., Des Moines

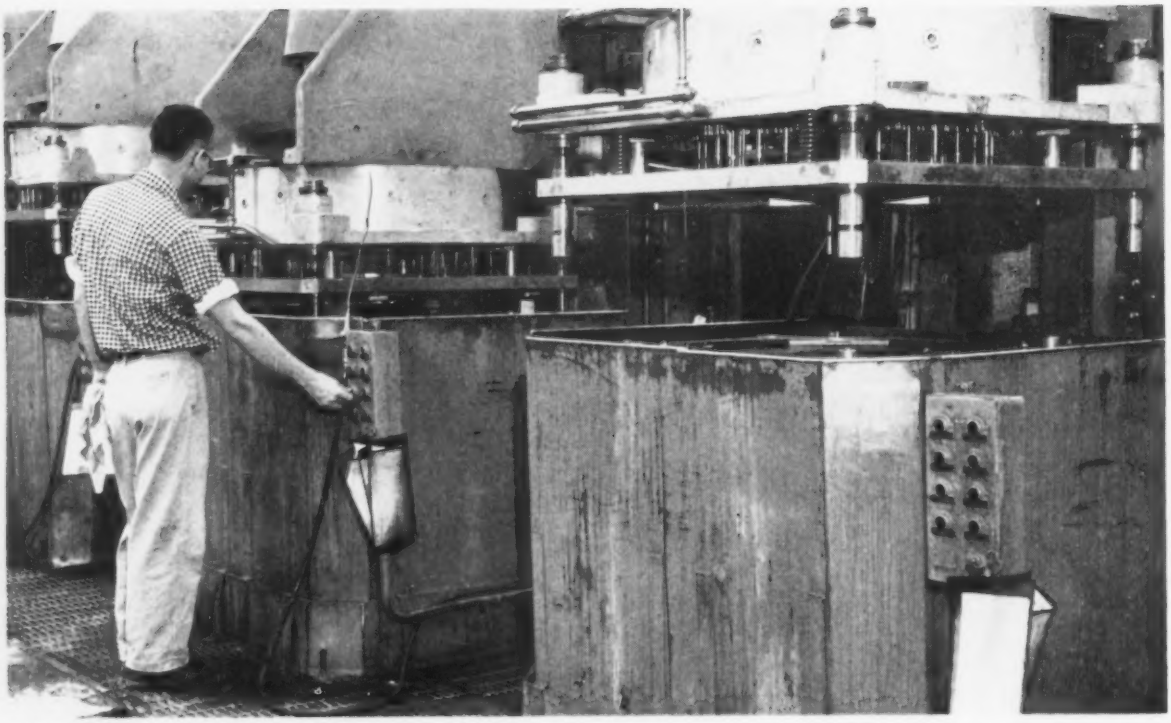
It depends on how you interpret automation: Does it mean plant-long lines of transfer machines, or is it just a fancy word for cost-cutting?

Smaller firms have to look at it from the latter viewpoint—a basic system of finding ways to do things faster and cheaper in terms of small-plant economics.

▪ Automation for small plants must be approached in a substantially different manner than that used by the industrial giants. The degree to which it may be used is dictated by length of contract, volume of production and potential future contracts. In other words, it is approached on a smaller scale and strictly on the basis of small-plant economics.

When automation is applied to a smaller company it has a dual effect on management. First, there is the broad effect on management planning—where to use it, how to use it, and how extensively. The second factor is its effect on the union bargaining groups.

To successfully seek and find business, you need market research and careful evaluation of the programs which will be undertaken. The Des Moines plant of Solar Aircraft Company makes jet engine assemblies for the major prime air-



MORE WITH LESS: Multiple drilling units take little space but can be changed quickly to any pattern.

craft engine builders. The plant produces many of the hot parts made from high-temperature alloys which are used in the latest jet engines. After a careful evaluation of new-engine programs which are in the formative stages, we finally determine that a particular engine has a worthwhile potential period of time in which to run.

Limit the Gamble—In all engine releases, initial quantities are small. Frequently the first orders will be for less than 50 assemblies. This poses some immediate problems from the standpoint of cost. If we were to build up production tooling as the schedule dictated, and develop a selling price based on just 50 engines, we would be creating a big obstacle in a competitive field.

Here's where sound management planning begins to pay off. There are many features of automation which require a substantial investment beyond the tool authorizations provided by the customer. Our production engineering personnel have learned to plan continually in terms of this moderate form of automation. And it'll probably be a long time before full automation develops to a point where smaller companies can go beyond this moderate approach.

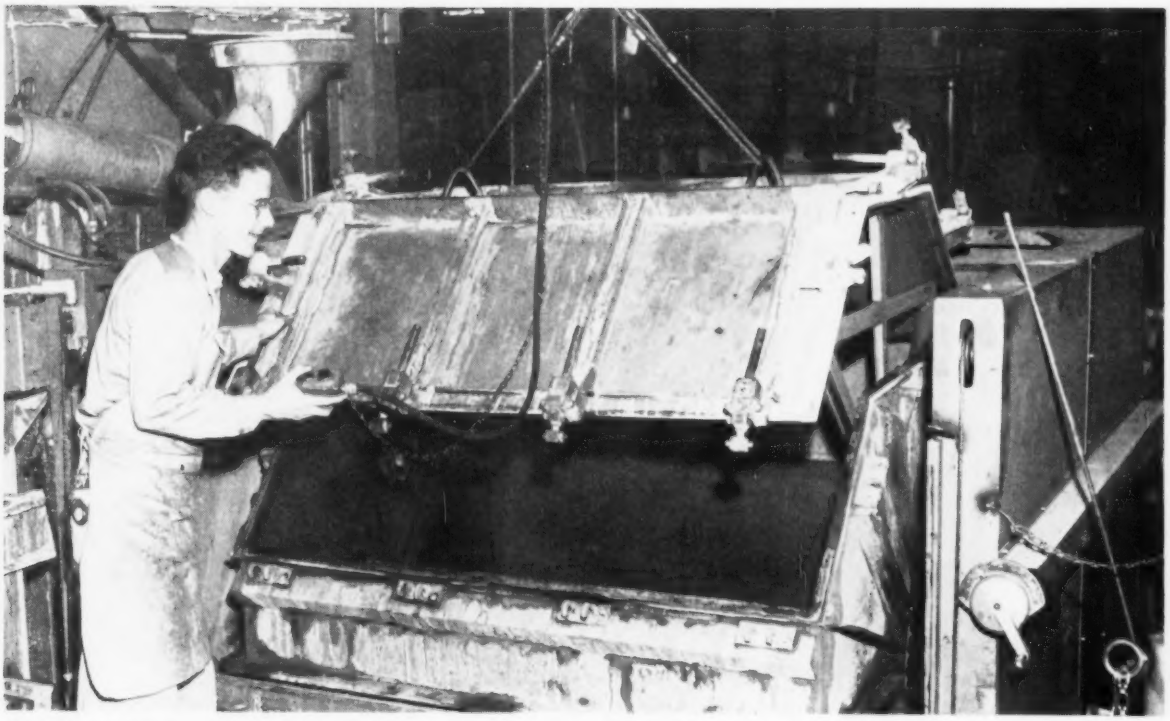
Semi-automation has permitted us to plan for production and still use substantially less floor space than would be needed if we stuck to conventional methods. Careful analysis of machining and welding operations plays a very important part in the development of plant layout, manufacturing plans, sequences and processing; they need to be studied out and determined prior to actual production. In some instances further improvements take place after a program has started, through methods studies and suggestions.

Effect On Union—Possibly as a matter of union philosophy, there's resistance to the idea that one operator can run two machines—even if the machines are running a fully automatic cycle and the operator has ample waiting time between.

This problem may be more difficult to surmount than the economic problems of providing the automatic equipment. The individual employee is immediately affected by the inconvenient, if short-lived, dislocation caused by installation of automatic equipment. He finds little consolation in the long-term benefits to the economic life of his community. And local union officials, particularly in small companies, are sometimes inflenced to a certain extent by political pressures of individual members—broader attitudes of the union's international office nothwithstanding.

Hence, the need for a program of communication that will inform production employees and union officials of both the immediate and long-term advantages of automation. It will help them to understand the necessity for measures which enable the company to make better products at lower prices. New entries in the competitive fields will have no time-worn precedents which meter output, peg the skill levels, allot minimum manpower for machines, or require standby personnel where none is needed.

Where Automation Is Used—



COSTS DROP: Tumble deburring of jet engine vane and shroud units is 75% faster than by hand.

Many of the parts currently being produced at Solar are for the J-57 turbojet engine. It powers the Air Force's new Boeing B-52 long-range bomber and the North American F-100 Super-Sabre, among others.

One of the components where automation has been applied is the combustion chamber case. This chamber requires 20 separate machining operations. On a regular vertical turret lathe and by conventional methods, dimensions are maintained by touching off a carbide tool to a gage point. This is a delicate operation that can easily damage the cutting tool, and requires subsequent measuring and gaging to verify accuracy. A complete machining cycle took 4.04 hours per case.

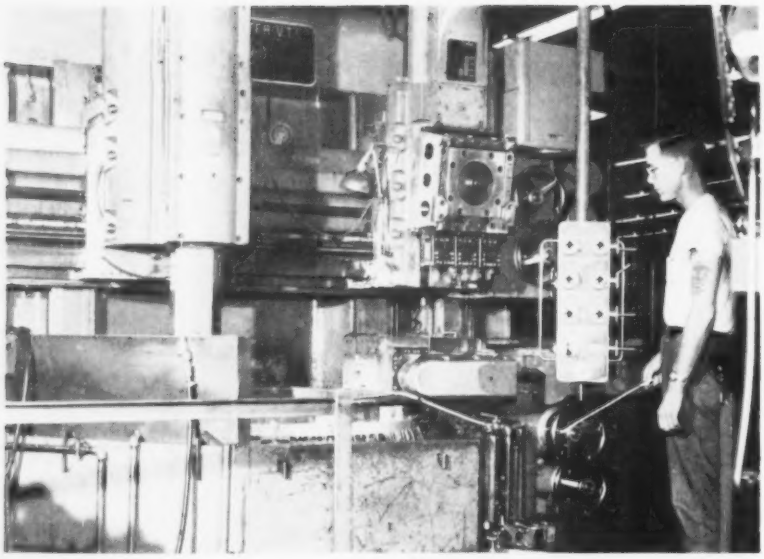
Recently we acquired several pieces of equipment called Man-Au-Trols. These are vertical turret lathes made by Bullard which incorporate a series of harps—a combination of electric and hydraulic controls. After pre-setting, they completely control the movements of the side ram and turret, including vertical and horizontal travel and indexing, and operate on a fully automatic cycle. The unit can produce as many as 42 independent operations, with the operator doing no more than remove chips. The full operation on the same combustion chamber case takes 1.97 hours, or less than half the time formerly required. The cost of this tool, however, is more than $100,000.

Cuts Brazing Time—Another example is the engine vane and shroud. This consists of an inner and outer shroud ring connected by up to 160 vanes. A high-quality brazed joint is required. Brazing was originally done by a hand torch, and took four hours per assembly.

Then a brazing machine was installed. Originally, it had a coil which brazed two vanes simultaneously, and the assembly was manually indexed by the operator. This involved up to 80 indexes and brazing cycles per assembly but cut time per unit to 1.27 hours. Continued study by our weld engineers resulted in a coil which brazed four vanes simultaneously, which again reduced cycle time to 0.81 hours. Considering this time still excessive, we began a development program for brazing assemblies under continuous rotation.

The latest version has a gear-reduction unit that drives the assembly in a clockwise rotation at a fixed speed. The induction generator is energized for a 100 pct duty cycle. Where the hand-brazing operation took four hours per unit, the new continuous-braze method takes only 0.51 hours. And by use of a dual-machine operation and one operator, this time can now be reduced another 40 pct. Current studies indicate that we will ultimately be able to braze both the inner shroud and outer shroud with the same savings.

Deburring Bottleneck — Another illustration is a typical deburring job on a vane and shroud, formerly done with a hand air-grinder. The first change was to install an automatic vapor blast process, and finally an automatic wash cabinet. But nicks or sharp edges were still found, requiring additional runs



SET IT, FORGET IT: Vertical turret lathes perform up to 42 separate operations, lop 50 pct off machining time for jet engine cases.

through the cycle. It was also difficult to eliminate the personal-opinion factor—different inspectors have different interpretations of what constitutes proper clean-up. The usual cycle took about one hour.

To reduce this time, a specially-designed tumbling machine has been installed. It has two large tumbling barrels which hold 14 assemblies on a central shaft. The assemblies themselves do not rotate. The barrel turns slowly with its 4000-lb abrasive charge, honing and polishing the sharp edges and nicks. An automatic tumbling device and conveyor hauls the abrasive to an overhead hopper from which it feeds by gravity—fed back to the tumbling barrel after a new load of parts has been fixtured.

This system completely eliminates hand deburring, vapor blast and wash operations. The new method is about 75 pct faster. And, more important, it is much less likely to damage the work.

Conveyorized Inspection — Still another example is the way in which compressor vanes or blades are inspected. The vanes used in both the high and low compressor sections of the engine, are formed of heat-resistant alloy sheet with an airfoil configuration. Fluorescent penetrant inspection is required as part of their quality control.

Originally the blades were magnafluxed by hand. The vanes were handled in lots of about 75, individually shot and viewed, then demagnetized in small basket-loads. The cost of this method was around 2½¢ per vane.

A special conveyorized system was designed and built. Now the vanes are first magnetized, after which they pass through two viewing booths. Then they pass through a demagnetizer located on the conveyor line and finally go through an automatic washer. With this new conveyorized inspection method vanes are now being processed at a cost of $0.0093 each.

Speeds Stabbing — Then there's the process for inserting the solid vanes into a sheet metal outer shroud. In shop slang this is called "stabbing" operation. The vane itself is used as a punch that remains in the shroud, becoming a part of the assembly. The operation requires backing the shroud band with a conventional die button having the proper airfoil cavity, and holding the vane with jaws that support it rigidly while it is being driven into position.

This was originally done on a hand-indexed cam-type die in a conventional punch press. The vane was clamped in the holding jaws and driven into the sheet metal outer band, then a second vane was loaded into the holding fingers, and the operation repeated. The average time per unit was 4.80 hours.

A special stabbing machine was designed. It embodies a cartridge from which vanes are fed automatically—one per stroke — into the holding fingers. A ram block backs up solidly against the work piece during the stabbing cycle. The machine indexes at the end of each stroke; before the index starts, the holding fingers release the vane and retract preparatory to the next stroke.

The vanes are now inserted in 0.120 hours per unit. The old method would have flooded the press room and involved full-time use of 30 expensive dies and a corresponding number of presses.

Use Standard Parts—One of our most recent innovations uses specialized tooling with standardized equipment. The drill units of this new equipment are driven by the spindle of a radial drill press; but the spindle retracts automatically and the fixture rotates automatically in a clockwise position, re-engages the drive mechanism and drills the next hole pattern. The parts and drill heads are standard off-the-shelf items which can be cannibalized and used in other applications.

Even the conventional process of Zyglo inspection has been greatly speeded up. Through use of a new overhead conveyor, Zyglo inspection is completely automatic on some assemblies; the only manual labor required is the time spent in the viewing booth.

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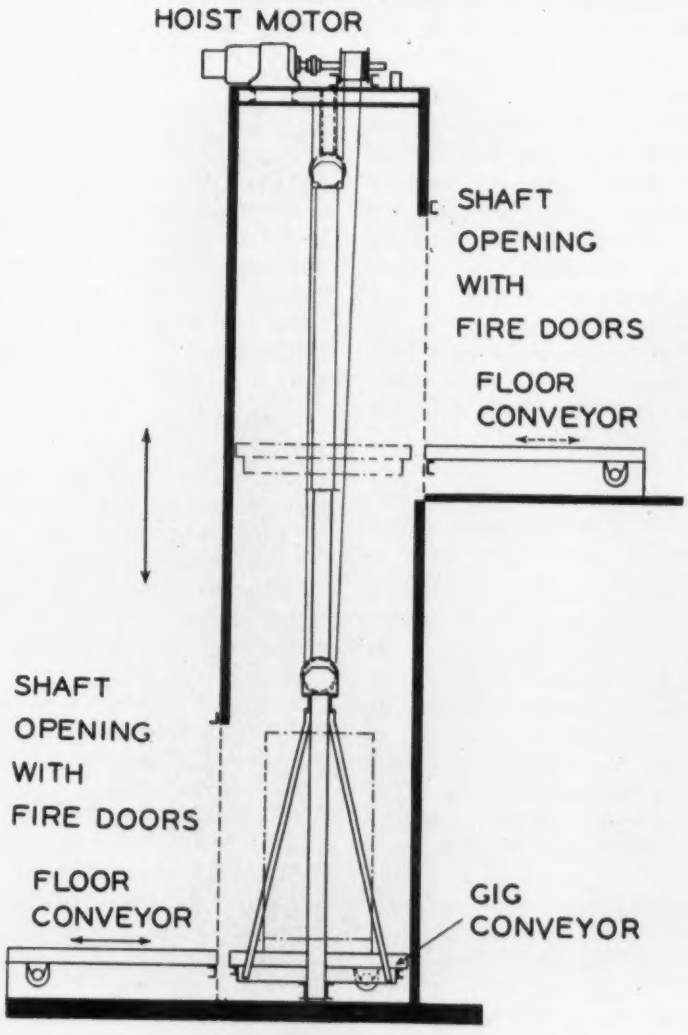
Interfloor Conveyors Move Unitized Loads Faster

By W. E. Engler—Vice President, Gifford-Wood Co., Hudson, N. Y.

Over-the-floor handling is simplified with material in unit form.

So why not have the transfer method between floors designed for the unit loads?

It's the key to getting the utmost in efficient production flow.



BASIC COMBINATION: The system operates in one or both directions. Controls can be as simple or complex as desired.

▪ Trends and developments in conveying point to more versatility, greater loads, higher conveying speeds and safer operation. It's done by increasing the range of these and other factors.

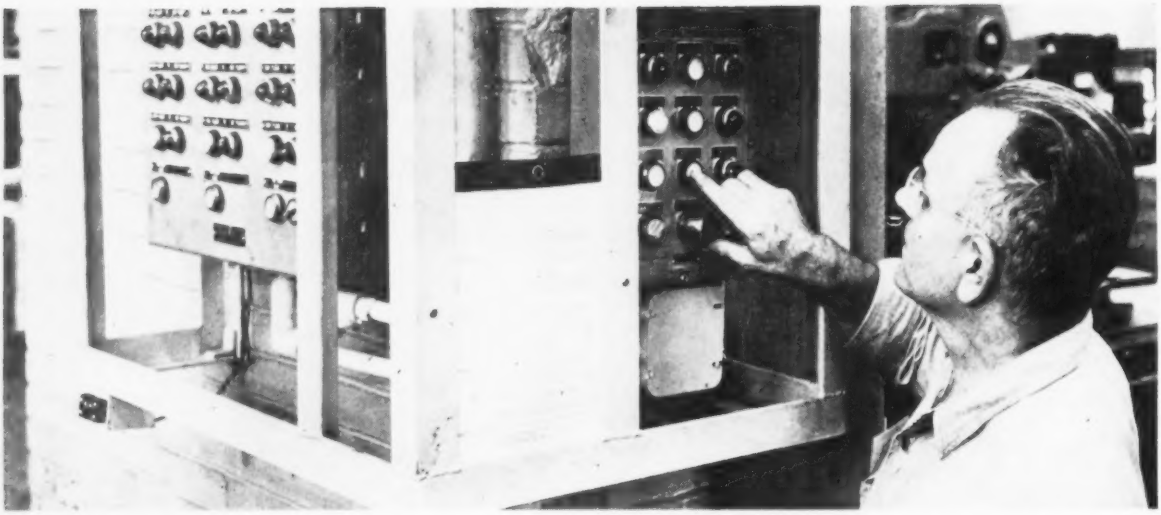
One of the companies specializing in this field, Gifford-Wood Co., Hudson, N. Y. provides installation and engineering service. The company stresses that interfloor conveying must keep pace with over-the-floor transfer if full benefit is to be expected in production flow.

What Kind Of Load?—The conveying engineer must consider the type of load. What is the maximum weight involved? What is the size? How is it handled as a unit? On pallets? In boxes or tote bins or similar carrying units? Or as a packaged unit?

By studying the specific problem and evaluating it in terms of the many components, the conveying engineer can design a system for specific loads. It's an equation of motor requirements, types of horizontal and vertical conveying elements, sizes of various units and the use of hundreds of electrical components.

Special conditions, such as fragility of material being handled, unwieldly bulks, and increased capacities affect design features. At the present time, automatic conveyors handle loads up to 13,000 lb, in sizes up to 300 cu ft. And that's by no means the ultimate in capacity.

From Where To Where?—Normally an interfloor conveyor solves a combination horizontal-vertical conveying problem. In selecting a location for the vertical conveyor,



CONTROL STATION: Operator sets up controls on panel at General Electric's Specialty Transformer Department, Fort Wayne, Ind. "Memory panel" (left) shows 16 routings serving four floors.

which includes an enclosing shaft, the choice depends on the space layout of the individual plant.

An existing elevator shaft can be used if it is convenient to the user and serves the required feed and delivery points. Or a special shaft can be erected to house the conveyor. Normally made of reinforced steel, this shaft can be erected in an area that conforms to plant layout as well as the desired conveying stations.

Construction of the shaft on the outside of a building with load and unload conveyors leading back into the building has recently become a desired arrangement. It saves valuable in-plant floor space while providing a modern automatic handling system.

Horizontal Conveyors—The wide range of types of conveyors permits the engineer to choose the type suited to the specific load. Live or gravity rollers, chains, belts, slats or special units can be used for horizontal conveying. Corresponding units inside the gig of vertical conveyor complete the horizontal transfer sequence.

Load stability, damageable loads and safety requirements are points to consider. For instance, bottle goods are handled on chain conveyors separated by steel plates.

Rollers with minimum center distances handle tote bins or similar mounted conveyors smoothly and without danger of tipping.

Where horizontal conveyors are usually constructed above floor level, Gifford-Wood is considering installing such conveyors in the floor itself. This can be done when construction of the floor offers enough rigidity and the layout of the surrounding area provides space for other components. It would conserve vertical space and eliminate the 15-in. fork-truck lift for loading and unloading.

Vertical Conveyors — Either a winding-type cable or a traction unit does the job of vertical conveying. It depends on installation limitations, housing facilities for motor units and safety factors.

Practically every vertical conveyor is designed for leveling the unit with feed and receiving conveyors, important where smooth transfer of glass or similar products is involved. Leveling involves reducing the lift speed of the conveyor (60-100 fpm) to a leveling speed (5-25 fpm). Precision limit switches control the final position of the unit.

The leveling speed can be provided by a two motor system. The gig contacts a switch in the shaft as it rises (or descends), which in turn cuts off the main hoist motor and starts the leveling motor.

A two-speed motor, with a ratio of 4:1 or 6:1, provides the same dual action in a single unit. But two motors are usually specified for larger conveyors, because of size and expense of the two-speed motors.

Load-Unload — Unitized loads should be deposited by fork truck at the end of the conveyor. Removal at the other end should have the same flexibility.

The customer's requirements for actuating the conveyor and space limitations for positioning the load are the primary factors determining load paths.

A manual push-button mounted within reach of the operator of the fork truck can start the first conveyor. Succeeding conveying phases are normally interlocked in sequence.

Conveyors can be actuated automatically, either by electric eye or micro-switch. The movement of the loading truck breaks the beam of the electric eye. When the load is in position, the beam is restored to actuate the conveyor after a timed interval.

Micro-switches can be installed under a spring mounted roller at

the load end of the conveyor. When the load depresses this roller, the switch starts the conveyor motor.

For delivery at an angle to the feed direction, provisions are made in the gig shaft for the gig to be rotated to the desired angle as it rises and descends.

Double-Deck System—Separate feeding and receiving conveyors on the same floor is done by means of a double-deck conveyor system. It eliminates the possibility of misdirecting loads because of failure to indicate proper direction through the control panel.

Combination receiving-feeding conveyors (two-way systems) are possible through the use of reversible or paired switches. Such a system is normally used at installations where one-direction flow of materials is following by a reverse flow for returning items (such as empty pallets, scrap or packaged items).

Index Loads—By indexing on receiving or loading conveyors, the conveyors can hold as many as 15 to 20 unitized loads. In loading, each unit is placed at the end of a conveyor. It moves forward one load length and stops by contacting a switch.

Succeeding loads follow it down the conveyor, each load being moved forward one position as forward loads move into the gig. The reverse procedure applies to an indexed receiving operation.

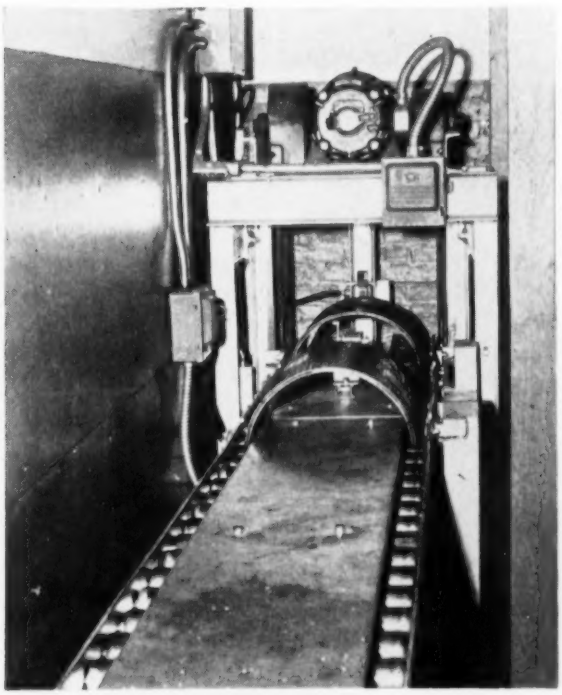
In both cases the entire conveying system is interlocked so that loads cannot be added when all index positions are filled.

All wiring involved in these systems is centered in a single wiring panel. Normally each electrical component is wired directly to the panel, simplifying trouble-shooting after installation.

Variety In Controls—The simplest controls include "safe/run" switches, start buttons, and for two-way systems, signal lights indicating direction of flow. Each control station in the system has its own panel.

At the other end of the scale, complete "thinking" conveyors can control the sequence of loads in a multiple conveying operation. Signal lights and alarm systems can follow any or all of the phases of the operation.

With differing state and local safety requirements, Gifford-Wood has an extensive range of safety components. In addition to all standard interlocking devices, these include: Safety plate for inside the gig to prevent personnel from riding; slack cable switches; and safety grabs for insurance against faulty cables; retiring cams for gig doors. Action of doors is normally interlocked with movement of horizontal and vertical conveying elements. Doors move from top, bottom or side of openings and can be of unitized or multiple construction.



SCRATCH-FREE TRANSFER: A printing plate starts vertical trip at the "Home News" plant, New Brunswick, N. J. Transfer from casting to printing area takes less than two minutes. Second plate waits return of empty gig.

AUTOMATE CONVEYOR: The system handles bulky 2000-lb rolls of newsprint through five routings at "Sun-Telegraph," Pittsburgh. Limit switch in upper right foreground activates ram which will push emerging roll from conveyor down incline (left).

Three Low-Cost Ways To Mark Metals Permanently

By R. A. Botosan—Research Director, The Electromark Corp., Cleveland.

Electrochemistry offers three inexpensive ways to mark metals permanently, safely and without affecting surface structure.

You can plate contrasting color marks, etch metal away, or deposit tough oxides in the form of your stencil designs.

Here are the essentials involved in each process, plus tips on where to use them.

▪ The permanent marking of metal parts has long been a problem with manufacturers. Some methods of marking are inadequate either from the standpoint of permanency or of interference with the surface structure of the part.

One technique which is frequently overlooked is electrochemical marking. It attacks the problem in a way that is different from any other. And the low cost of equipment and supplies makes the process adaptable to a great many uses.

It is obvious that it would be unsatisfactory to mark a fine chrome or nickel finish with a steel die. The breach of surface would not be desirable even if the die could withstand the impact on such hard finishes.

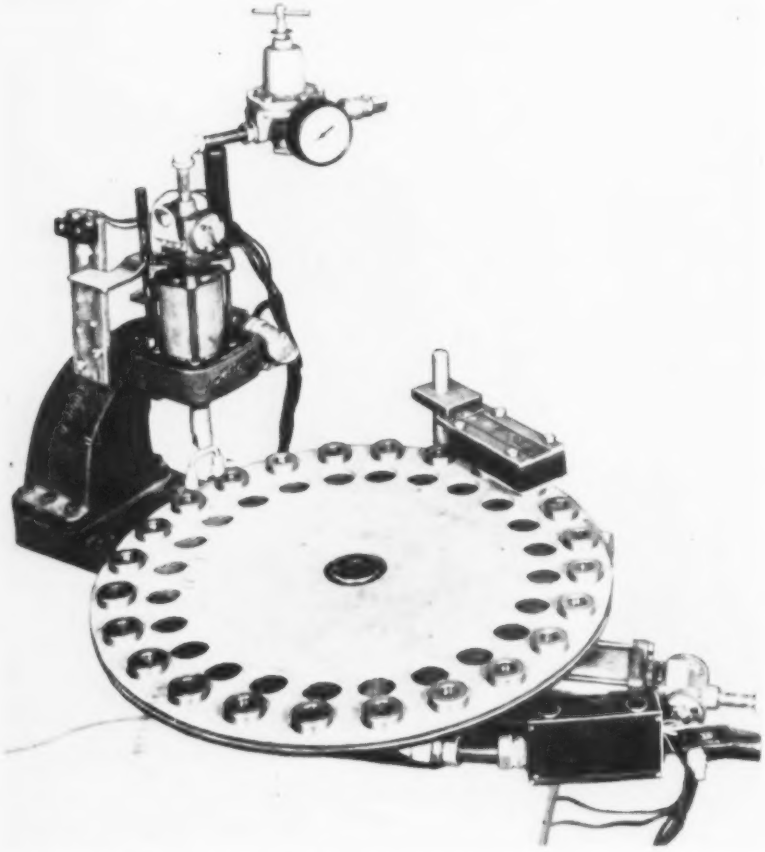
Marks Hardest Metals — The same is true in many other cases. Carbides, stainless steels and titanium alloys tend to defy mechanical marking because of their surface hardness. However, these materials can easily be marked electrochemically without any stress or distortion.

The electrochemical marking process depends on the principles of electroplating. The technique can be varied to produce three distinct types of marks on conductive surfaces. In each case an absorbent felt pad is fastened to an electrode and covered with a stencil. Stencils do not have broken lines, therefore any line drawing may be reproduced on metal by this process.

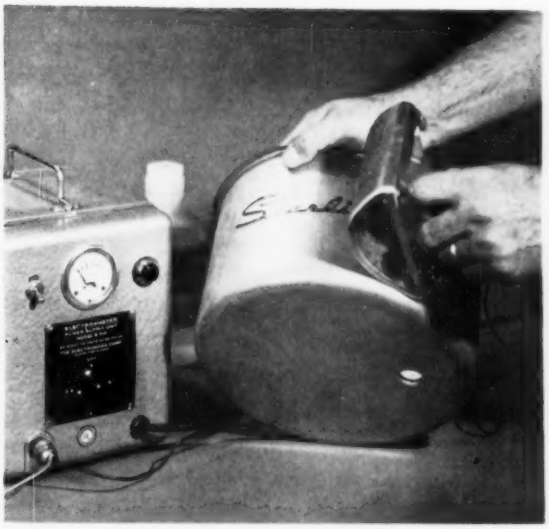
A power unit is required, of course. Hand marking is quite practical, and available equipment is designed so that the operator can select the type of mark desired: (1) a plated mark, (2) an etched mark, (3) an "ac" mark.

For Color Contrast—A plated mark is made on a workpiece by depositing a metal of a contrasting color in the form of the stencil. Using dc power, the negative contact is connected from the power source to the material to be marked.

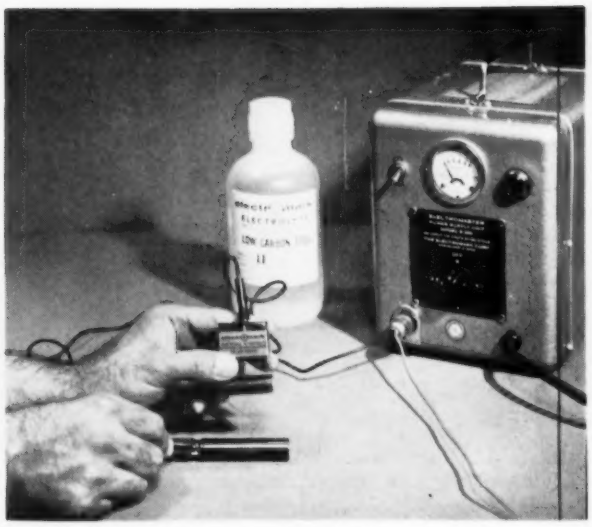
Next, some plating solution is placed on the felt pad and the



AUTOMATION HERE, TOO: Two bearing races are marked electrochemically and simultaneously every time this dial fixture indexes.



ROCK IT ON: With electrode and pad in a rocker assembly, trademarks or other identifying symbols can be applied to curved surfaces.



THIS IS QUICK: One second is all it takes to put a clear, white mark or symbol on the shank of this black oxide-coated reamer.

electrode is connected to the positive pole of the power unit. On pressing the electrode lightly on the workpiece, a plated mark appears in the form of the open areas of the stencil.

However, good results are not always obtained by this direct plating method. The surface of the work must be prepared as for any plating operation, and this is not always practical. Also, the plated metal mark may cause a galvanic action between itself and the workpiece and therefore be a potential source of corrosion.

Etch It Away — To make an etched type of mark electrochemically, a small amount of metal is actually removed from the workpiece surface. With this technique, the leads from the dc power source are reversed and the positive contact is connected to the work. The negative lead is connected to the electrode and a special electrolyte is applied to the felt pad.

When the electrode is pressed on the piece to be marked, an etch occurs in about one second. It can be made to have a matted appearance by adding certain chemicals to the electrolyte. This type of mark is especially useful with highly polished surfaces.

The third type, or so-called "ac" mark, produces a stable oxide of a contrasting color in the marking area. It is most generally used for marking ferrous metals. One lead from an ac source connects to the work to be marked and the other goes to the electrolyte-dampened electrode. Contact between the electrode and a ferrous workpiece produces a black mark.

On And Off—Since alternating current is used, metal is plated and removed at rapid intervals. When the current travels from the work to the electrode, there is actual removal of metal.

This metal is brought up into the felt pad in contact with the electrolyte. Since the electrolyte is highly charged, it easily converts the particles of metal to an oxide form. These particles are then plated on the return cycle.

This process continues until the marking area is densely plated with black oxide. This is the stable form of ferrous oxide and not the ferric form of iron rust. No rusting will occur on a steel part provided the part is dried and oiled after marking.

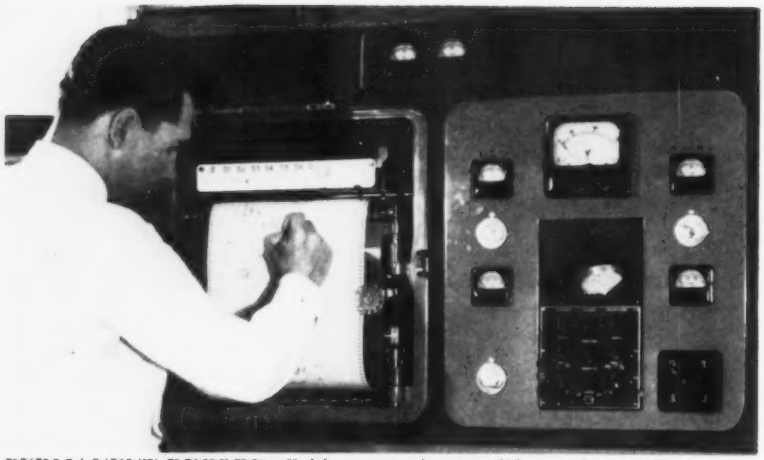
Salts Are Critical—The electrolyte used for "ac" marking is very important. To avoid galvanic action which might result from introducing another metal, salts must be used which will convert to stable metallic compounds.

Safety and cleanliness are additional advantages of electrochemical marking. The electrolytes generally will not stain hands or clothing. The solutions will not etch metal without current being applied, and no toxic fumes are given off in the marking process.

As a rule, a selection of either black or white marks is possible. For example, by selecting the proper electrolyte, black marks may be made on aluminum. In this case the mark consists of stable sulfides rather than oxides. With titanium, zirconium, and uranium, various colored marks may be produced.

Most electrochemical marks are quite visible after mild etching, heat treating and pickling processes. Some will even remain after plating or anodizing, and all such marks are impervious to organic solvents.

Thus, bare metals of any thickness or hardness can be marked quickly, clearly, safely and permanently by this low-cost method.



PERMANENT RECORD: Cabinet contains amplifier and recording potentiometer. Checking panel on right contains oscilloscope in center.

Read Spectrograph Directly for Rapid Analysis

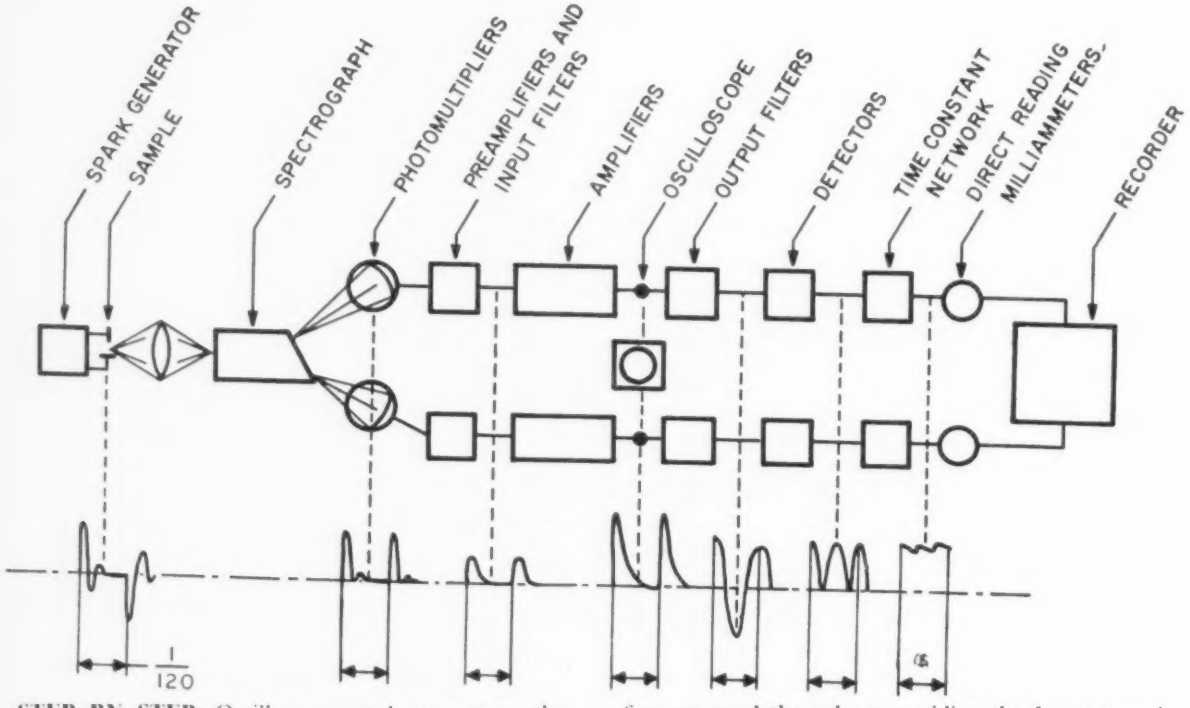
Instantaneous, direct-reading measurement has given a boost to many phases of metalworking.

It's not surprising then to find that it applies so well to analysis of alloys.

With more and more elements being added to alloys, it's a timely advance for getting faster results.

▪ Developments in spectro-chemical analysis of alloys have been watched closely for signs of progress to speed up measurements and improve accuracy. The benefits of such speed and accuracy are aimed at both the foundry and the research laboratory.

There is a promising answer in a direct-reading instrument called the "Automatic Spectro-Lecteur." It's an instantaneous recording spectrograph designed and produced in France by Company Radio-Cinema, Paris. It's available in the United States through Interconti-



STEP BY STEP: Oscillograms at bottom trace the signal at each conversion. Alternating current amplifiers are used throughout, avoiding the frequency adjustments of direct current amplifiers.

nental Electronics Corp., Mineola, N. Y.

Stress on Speed—The instrument satisfies the first requirement of alloy analysis: rapidity. The time to perform an analysis of an alloy depends on pre-sparking time, the recording time for each element and the number of elements. The average time for complete analysis under routine conditions is 1 minute 30 seconds.

The change-over from automatic analysis of one type of alloy to another can be done in less than one minute where the alloys are of the same basic metal, or in less than five minutes if the basic metal is different.

The time required for the analysis itself has become negligible compared to the time needed for sending samples to the laboratory and returning the analysis to the furnace. Some users are installing pneumatic tube transmission between furnaces and the laboratory.

Accuracy in Photocells—In spectro-chemical analysis the energized particles of metal emit ultra-violet radiations which enter the slit of a spectroscope. Where heretofore a photographic plate has been used to record the spectrum, the Spectro-Lecteur uses a pair of photomultipliers.

The instantaneous readings are obtained through electrical measurement of potentials across the terminals of condensers loaded by the photomultipliers. One of the two photomultipliers is set to receive radiations from a standard line. The other travels along the focal plane of the spectrum to receive radiations from the line of each element in turn according to a prearranged program. The intensity ratio of the two lines is continuously recorded on a strip chart.

While integration errors affect the accuracy of a photographic plate, the photomultiplier has better sensitivity to short wave radiations. Weak lines normally lost in background effect can be detected.

Interpret Graphs—By recording the typical pattern corresponding to each element, the direct-reading technique suggests areas of research and industrial control not previously obtainable. Following a great quantity of analysis results on various alloys, it is estimated that the standard deviation is as low as ± 1 pct. This represents a three-fold improvement over the photographic method.

The high sensitivity of the instrument permits analyzing pure aluminum for traces as low as 0.003 pct of Fe, Si and Cu.

The visual presentation allows for both quantitative and qualitative analysis of any given sample. It opens opportunities for analysis of non-metallic materials.

Direct-Reading Head—The basic measuring component, the direct-reading head, is attached to a standard medium dispersion quartz spectrograph. The head is fitted in place of the plate holder and can be readily switched over to return to the use of a photographic plate.

The head contains the two photomultipliers, a master ruler, a program ruler and two wave length dials. The master ruler is fitted with studs for the element lines to be used on the spectrum. The program ruler is fitted with slots corresponding to the elements chosen for one analysis.

The wave length dials bear linear scales indicating the position of the photomultipliers on the spectrum, reading at an accuracy of $\pm$ one angstrom.

To avoid excessive temperature conditioning of the laboratory, the direct-reading head is fitted with a temperature corrector which can be set at any given point between 61 to 90°F. Any slow drift resulting from a temperature change can be corrected by means of a micrometer screw.

Wide Range of Alloys Analyzed by Direct-Reading

Basic Metal of Alloy	Type of Alloy	Components and Impurities Commonly Analyzed
Iron	Steels with carbon	Ni, Ti, Cu, Mo, Va, Mn, Cr, Si.
	Steels with chrome-copper (0.5 Cu 0.6 Cr)	Cu, Cr.
	Steels alloyed to nickel, chrome, molybdenum	Ni, Cr, Mo.
	Steels of nitriding process	Ni, Mo, Cr, Al, Si, Mn.
	Austenitic steels with 12 pct manganese	Mn.
	Spring steels	Mn, Si, Cr.
	Steels 18/8	Ti.
Aluminum	All common and special alloys	Fe, Cu, Mg, Mn, Si, Zn, Pb, Ti, Ni, V, Cr, Zr, Be, Mo, Co, Sn.
Magnesium	All common alloys plus special Mischmetal	Al, Zn, Cu, Si, Mn, Fe, Ni, Th, Ce, La.
Zinc	Zamak alloys	Al, Cu, Mg, Fe, Sn, Pb, Cd.
Copper	Brass, Bronze, Nickel-silver, Aluminum-bronze, Beryllium-bronze	Zn, Sn, Pb, Al, Ni, Be, Fe, Mn, Bi, P, Sb.
Lead	Pure lead, soldering and anti-friction alloys	Sn, Sb, Ni, Zn, Cu, Fe, Al, As, Bi, Ag, Tl.
Miscellaneous	Analysis of soils, ceramics, glasses, slags, cements, etc.	Al, Si, Ca, Na, Ba, Fe, and many others.

Induction Harden Small Lots for Extra Benefits

By R. T. Hook—Chief Metallurgist, The Warner & Swasey Co., Cleveland.

Why harden an entire part when only certain localized areas really need treatment?

Induction hardening is one way to keep costs down while getting the right degree of hardness in the right places.

What's more, the process is practical for short runs on parts of assorted sizes and shapes.

▪ Induction hardening is often considered as a specialized method of heat treating that applies only to fancy designs or mass production items. Where this view is held, engineers often design away from the use of localized hardening by going to more expensive methods or materials.

This needn't be so, as shown by the techniques used at The Warner & Swasey Co., Cleveland.

In 1948, the firm bought a 450 kc, 50 kw induction hardening unit to harden the bed ways of ram type turret lathes. The equipment also had a work table for hardening small parts.

Expanding Use—A growing volume of small-part hardening soon taxed equipment capacity to the point where a separate power source was bought for the bed hardening unit. The older power unit and work table were then used 100 pct for localized hardening on bevel gears, jack shafts, bearings and similar items.

In 1952, the firm expanded, setting up a plant at New Philadelphia, O., which could use the high frequency machine and its work table to good advantage. This left the question of what type of replacement equipment should be bought for the Cleveland operation.

A motor generator-powered unit was proposed, and a study of eight parts which could be handled on such equipment was made to see if the expense was justifiable.

Savings Tell Story — When an estimated annual saving of $7,156 was indicated for these eight items, it was decided to buy a motor-generator set and ship the old 50 kw unit to the new plant.

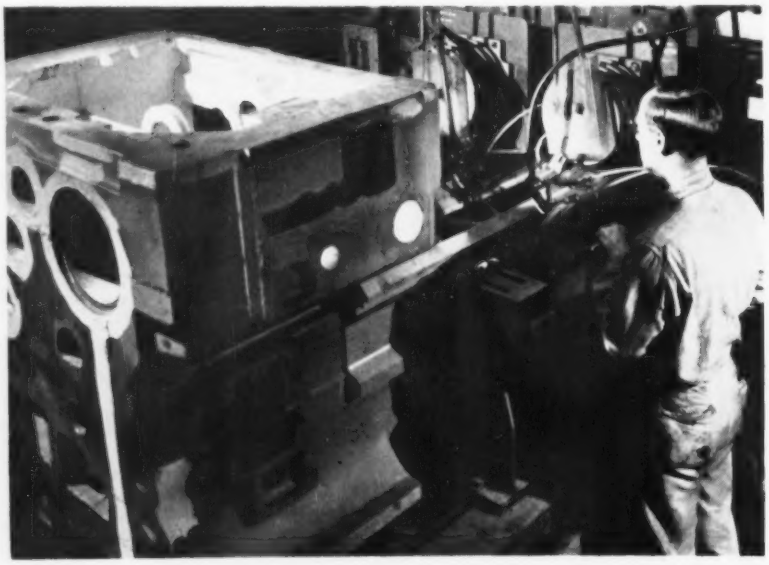
Another potential work load turned up when it was considered desirable to specify induction hardening for many of the headstock gears on "A" type turret lathes. Keyed gears which did not require a hard hole and could be hardened on the teeth only were put in this group. Sizes ranged from 5 to 18 in. OD.

Special Hardening Unit—Having outlined the parts to be treated, a special unit was designed by the motor-generator manufacturer to accommodate them. The traveling length was 65 in. for long slender parts with an outside diameter of 27 in. for gears.

The final unit decided upon consisted of a 100-kw, 10,000 cycle motor generator set, a field station, a small hardening unit which traverses a 30-in. length and about a 9-in. OD. There is also the large fixture which can handle a 65-in. length and 27-in. OD, quenching parts in oil or water.

About the time of the building of the large fixture, an oil fire at a local commercial induction hardening company brought out the danger of fire in this unit.

Safety in Emulsion — In the



LOCALIZED TREATMENT: Lathe bed ways are hardened uniformly and economically by modern induction heating and quenching techniques.

course of meetings on fire prevention controls, it was suggested, "Why not develop an emulsion quench which would have the cooling rate of oil and the safety of water?" Because this plan seemed more feasible than the use of automatic CO_2 units or other fire control devices, a search for a workable emulsion was begun.

A ratio of one part of cutting oil to 10 parts of water was found to have the proper cooling rate. It was noted later that others working with this same problem independently and simultaneously came up with approximately the same ratio and generalized rules for its use.

The ratio must be kept at 1:10. Periodic checks with a sulphuric acid test take care of this. By adding 5cc of concentrated sulphuric acid to 50cc of the emulsion, the separation immediately defines whether the ratio is proper.

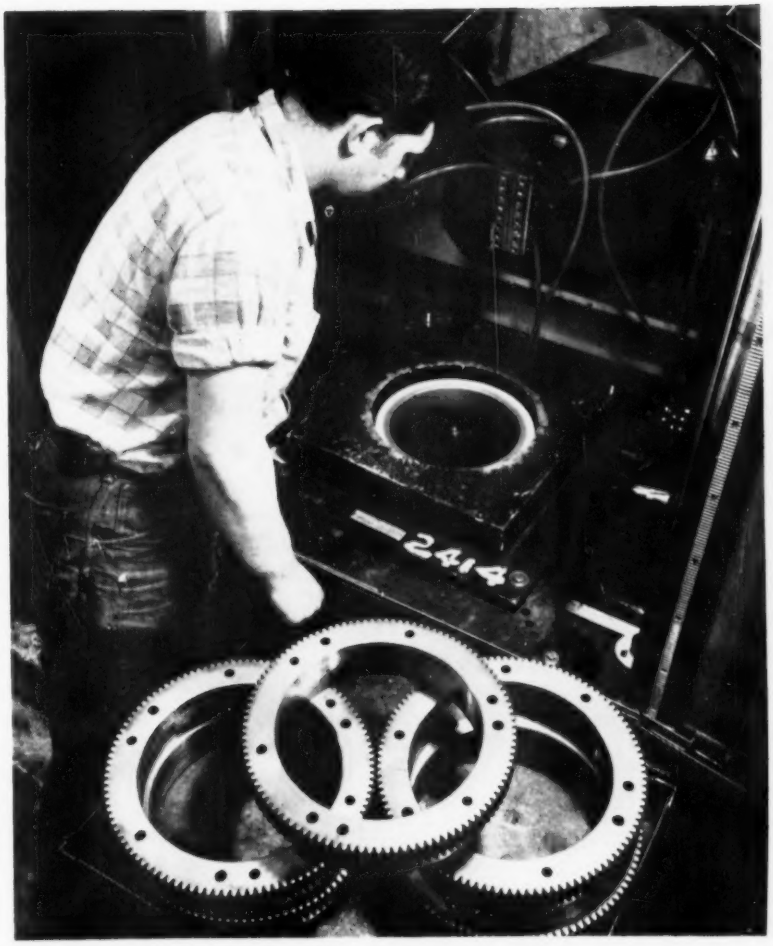
Change in Materials—Where it was normal practice to use AISI A-4150 steel for gears in furnace quenching, AISI A-4145 proved better for reducing cracking at the root of the teeth on induction hardening.

In cases where C-1045 materials had been used on large parts, the material was changed to C-1050 for parts over 3 in. diam to obtain proper hardness.

In all cases, however, temperature of the quench emulsion must be kept under 90°F for carbon steels and 130°F for alloy grades to get uniform hardening.

At present the machine works two shifts of eight hours each. Occasionally two 10 hour shifts are needed to keep up with the load.

Distortion Control—A good example of distortion control by the use of induction hardening is the case of a sleeve gear of 6½-in. diam. One lot of 125 pieces, normalized and annealed by an outside source, was quenched in a normal atmosphere furnace. Of this lot 90 pieces were more than 0.005 in. out of round after quenching and tempering.



ONLY THE TEETH: Induction heating and emulsion quenching of gear teeth only insures tight control of distortion in critical areas.

A second lot of this same part was then normalized and annealed in the company's own plant and run through the same furnace procedure. In this case 20 pieces of the 125 exceeded the 0.005 in. limit.

A third lot of 125 pieces, selected, normalized and annealed in the company's plant, was martempered in order to reduce distortion. Only six pieces of the 125 exceeded tolerance limits.

The fourth lot was treated with the induction method. The teeth only were hardened and then quenched in the emulsion. Inspection showed that not one piece was out of round.

Efficient Procedure—These successful results on gears are obtained by hardening ⅛ in. below the root of the tooth and quenching in the emulsion, following with a tempering operation at 450°F. Hardness is maintained at 50-55 RC. Timers on the induction unit are checked regularly to see that hardening cycles produce consistent results.

To reduce handling time, the tempering furnace for all induction hardened work is adjacent to the induction unit.

Because the plant does not work a third shift, some means had to be devised for using the induction unit on the entire second shift. The solution was to put timers on the tempering furnace which allow parts to remain therein over night. Setting a timer shuts the heat off at any specified time. Thus, work is cooled by morning and ready for unloading.

Tracer Controls Change a Job

By J. E. Dillon—President, Darco Industries, Inc., El Segundo, Cal.

Efficient tooling and trained people make a good team in any machine shop.

Add a third element—tracer controls—and the job machine shop can tackle the most complicated assignment.

The combination enables shops to accept jobs that previously had to be turned down.

▪ Success of the growing job shop is almost in proportion to its equipment capacity. It's reached by getting new tools, training people to use them efficiently and then selling the combined effort to a customer. This is particularly true with tracer-controlled machines.

The tracer-controlled machine is a big asset to the average job machine shop operator. It enables him, with a minimum outlay, to do work which formerly required capital machine tool investments running into six figures.

Handles Variety—The job shop operator, because of the tracer-controlled machine, can now take part in all production procurement programs. He can hog out plates, billets and slabs to complicated designs for test parts, tooling tryouts, engineering changes, quick fixes, and short or long production runs where forging dies are too costly or unobtainable. In fact, the operator can duplicate forging dies.

The operator can also take in a large variety of work, quote, meet quick or short due dates, operate with a minimum of tooling and deliver quality products at low cost.

Darco Industries, Inc., El Segundo, Cal., found that it was necessary to go into tracer-controlled machines. This was brought about after Darco had turned down good jobs because existing equipment was not able to do all that was required. Other jobs were lost due to the high cost of machining.

The first tracer-controlled machine brought into Darco was a 10-foot Detrich and Harvey open-side planer with a 10-hp, two-speed motor, one 3D valve and one 180° valve with six-position turret stops for pocket work. This machine was selected because of its capacity and rigidity. Since then, 8, 10, 12 and 16-foot conversions of like make have been added.

Cost Is Low—Compared to a conventional No. 6 vertical mill, the capital investment for a conversion of this type is low considering its range and versatility.

Here's how costs have been cut with the tracer-controlled planers: (1) They do all fly cutting—often in rapid traverse; (2) By locking out one horizontal tracer valve sector and using a counterweight on the stylus, the straight-line feed rate can be from 0 to 60 ipm; (3) They stack four times the normal amount of work on the table; (4) Multiple jobs can be set up on one machine at one time while runs are intermittent and parts held for heat treatment, engineering clarification, material delays, etc. In this case, the operator moves from one job to another with little lost time due to set-up. Usually, he moves to merely change the cutter and stylus for the next job.

To standardize tooling and reduce set-up time, all templates and holding fixtures have tool-mastered

ONE MACHINE: This entire external wing member was machined in the same machine. Used for in-flight refueling, it's made of 75ST aluminum.

Shop's Outlook

holes. A constant center distance from cutter to stylus is used on all machines.

Use Five Types—Tooling generally falls into five categories, all using standard work-holding fixtures: (1) Flat templates with cutouts usually made from photo aluminum sheet; (2) Wood or metal patterns; (3) Combination or stacking templates used with flat overlays or three-dimensional overlays; (4) Built up sheet aluminum templates in laminates; and (5) Sample part.

Choice of tooling depends on the nature of the job, lead time, chance of repeat orders, etc. If the part is intricate and complicated to machine, wood patterns or sample parts are preferable. The machine operator and inspectors can visualize the part. This tends to reduce the stop-and-go time consumed by planning, tooling, inspection, production and interpretation.

If the quantity is small, wood patterns are used for the run. For larger orders, a cast aluminum duplicate of the part becomes the master tool. Wear from pattern to stylus is negligible for most jobs.

To standardize end mills and holders, Putnam - type locking holders with 2-in. and 1½-in. adapters are used. End mills are kept in kits to be reground at the same time as the stylus. For nonferrous metals, the most useful end mill is a 1½-in. diam two-flute with 4-in. cutting flutes. For steel, a four-flute cutter works best.

Cut Idle Time — Idle machine time is reduced by assigning two operators to each setup. It also offers a chance to train a second man.

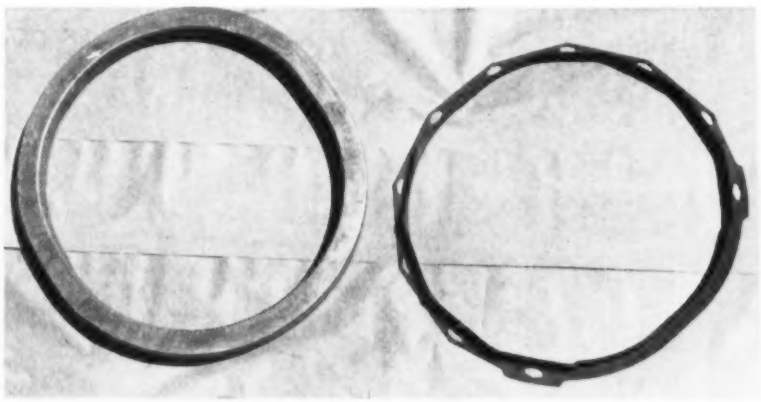
Before setting up any job, make a "dry run" to check out the fixtures, templates, cutters and other equipment, particularly when the customer furnishes the tooling. When such is the case, you can cut tooling by about 80 pct because most of it is designed around Hydrotel or Keller-type machines using one tool and one holding fixture for each cutting operation.

Planning a job before it gets to the machine cuts idle time even more. Elaborate operation sheets spell out every operation in detail. A sketch is included if needed for clarity.

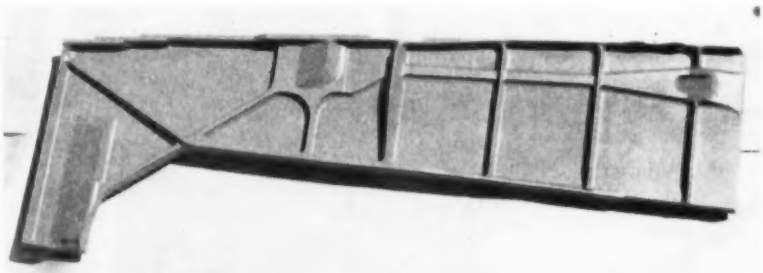
When planning the sequence of operations, some warpage is to be expected. But by cutting certain areas and specifying the direction of the cuts, it's often possible to eliminate the need for straightening. At times, parts are purposely distorted so that straightening isn't necessary after machining.

Set blocks on all machines with increment moves constant reduce bench time where 3D operations with ball mills leave cutter marks. Better finishes result by increasing the feed rate and reducing increment steps. A small burr tool developed for use with a drill motor removes edges and chamfers corners.

Takes Little Tooling—A job well suited to contour machining is a ring made of 2024 aluminum alloy bar 120 in. long by 2½ in. square. Before machining, the ring weighs about 75 lb but after machining it weighs only 6½ lb. Inasmuch as the finished part must fit a master check fixture, each machining op-



RING JOB: Contour machining removes more than 90 pct of the original metal from this ring. Material is a 2024 aluminum alloy.



CUTS DOWN MOVES: It took 90 distinct operations to make this beam by contour machining. Original weight—280 lb; finished—28 lb.

Benefits of Tracer-Controlled Machines

1. **Well-balanced machine load.**
2. **Less tooling.**
3. **Better quality.**
4. **Increased production.**
5. **Lower costs.**
6. **More stable backlog.**
7. **Ability to bid on almost any job.**
8. **Meet competition.**
9. **Ability to accept more jobs.**
10. **Do more complicated work.**

eration must be done with extreme care.

Basic tooling for making this part consists of forming templates, a drill jig, holding fixtures and a master profile pattern. The latter is made from 2-in. cast aluminum plate and duplicated from a series of sheet aluminum templates taken from loft photos and the master check fixture. Darco usually makes the flat templates in its own tool room and the master pattern on the contour machine.

Another example is that of a beam which is machined from a 280-lb Q266 magnesium billet. When finished, this part weighs 28 lb.

In machining this beam, there are 90 distinct operations. If done in a conventional way, the job would require 180 moves in and out of a machine. Also, an infinite number of tools would be needed. It's quite probable that the cost of such a part would be more than that of the machine on which it is now made.

Works on Steel—The benefits of using tracer-controlled machines on steel are just as many as for aluminum and magnesium. A 4340 steel collar having an original weight of 120 lb, and only 9 lb when finished, points up how such equipment can be used for a small part of an over-all job and still pay its way.

The collar requires 29 separate machining operations, of which only two are done by tracer-controlled equipment. Yet, these two operations would normally require 14 operations by conventional means.

Many other jobs are routed to tracers for one or two operations. In many instances, as much as 95 pct of a job is done on conventional equipment and the remainder on tracers. Yet, the 5 pct which is done on tracers would cost more than the 95 pct if machined any other way.

Heavy Work Loads—The usual tendency is for work loads to build up far beyond the tracer-controlled machine's capacity. The reason for this is due primarily to the fact that more uses are found for the equipment than were first anticipated.

As much as 90 pct of a plant's machined output is likely to find its way to tracers, if only for one or two operations. Even simple profiling and routing jobs are sent to these machines. By stacking parts, 20 pieces can be done at one time, set-up and running time are less, and bench time is cut sharply because only the top and bottom pieces throw a cutter burr.

Tracer machines are used as vertical mills, slab mills, profile mills, drill presses, jig borers, routers and various combinations including three-dimensional duplicating. On one machine alone at Darco jobs have ranged from ½-ton billets using 18-in. flycutters and 2½-in. end mills down to ½-lb parts using ⅛-in. end mills for "O" ring grooves and 0.093-in. drills.

Engine lathes with tracer control are economical and time saving. By using a single template and tool, complicated parts can be duplicated without expensive form tools and setups.

Makes It Automatic—Actually, a tracer-controlled lathe makes the machine fully automatic for short or long run production. For the most part, the operator only watches the machine for tool wear and proper loading of parts, rather than a continual check of dimensional tolerances caused by positioning of multiple tools, dial readings and lineal stops.

Cost of tool setups on repeat jobs is also greatly reduced. When a periodic run is completed on a tracer-controlled lathe, the heating fixture, cutting tool and template are stored away. When they are needed again, they can be readied for use in less than a half hour—a time saving from 300 to 400 pct of conventional equipment.

Tracer control rise-and-fall mills are very economical for lots of not more than 50 pieces. By their use, special cutters and complicated tooling can be practically eliminated.

Conventionally, the procedure calls for a string of tools and a complement of form cutters requiring complicated setups and close coordination from machine to machine. A great amount of hand-blending and tighter inspection controls are also required.

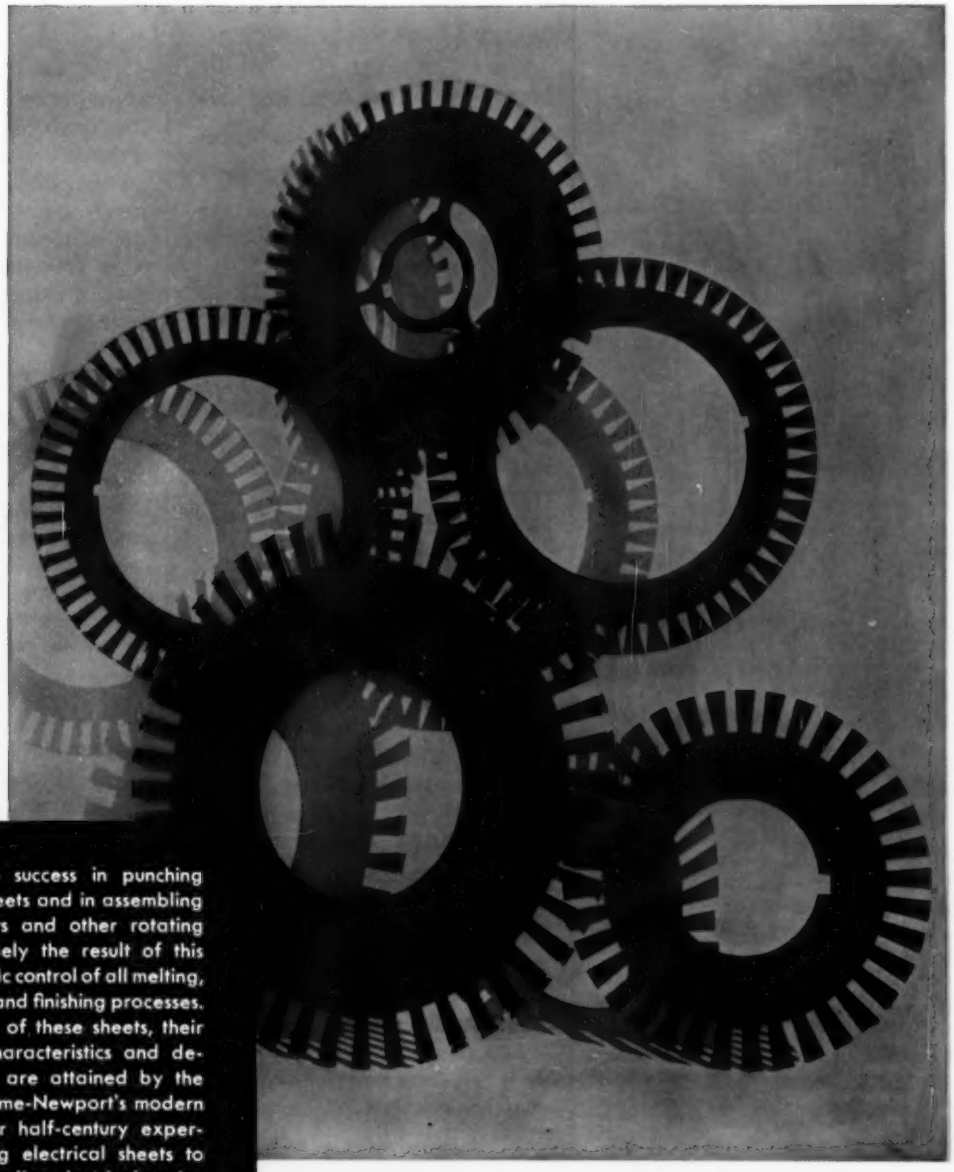
Couple Operations — By gang-milling multiple cuts on the tracer rise-and-fall, it's possible to couple this series of singular operations into a complete cycle. All that is necessary is a cam, a cam-roller, a holding fixture and standard cutters.

Product quality is entirely in proportion to the cam. If the cam is perfect, the possibility of reproducing a reject is slim.

In terms of cost amortization, the machines pay for themselves in less than one year. At the same time, these cost savings can be passed to the customer. But perhaps a more important benefit to a job shop operator is his ability to make almost any product for which he may be called upon.

Acme-Newport

ELECTRICAL SHEETS PUNCH FAST AND CLEAN



Users' immediate success in punching Acme-Newport sheets and in assembling motors, generators and other rotating equipment is largely the result of this Company's scientific control of all melting, rolling, annealing and finishing processes. The uniform gage of these sheets, their clean punching characteristics and dependable quality are attained by the combination of Acme-Newport's modern facilities and their half-century experience in producing electrical sheets to specifications of leading electrical equipment manufacturers. Our electrical engineers would like to discuss your requirements and our ability to fill them.

Acme-Newport Steel COMPANY

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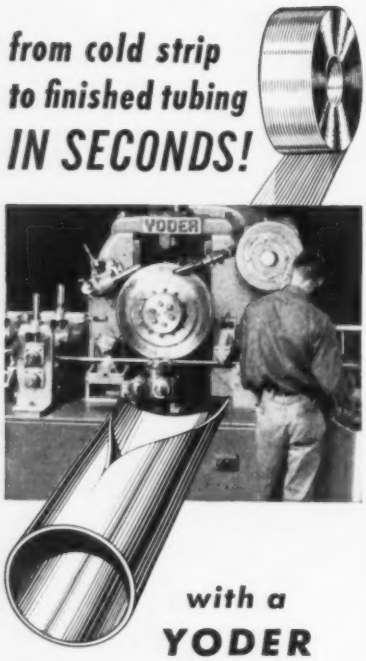
from cold strip to finished tubing IN SECONDS!



with a
YODER ELECTRIC-WELD TUBE MILL

One of the fastest . . . and one of the least expensive . . . methods of making steel tubing is with a Yoder Electric-Weld Tube Mill. The Yoder method eliminates the need for time-consuming heat treatments and costly conditioning furnaces for most tube needs. Scrap losses, too, are far lower than any other method . . . usually less than 2%.

The Yoder Type-M Mill shown above is operated by one man and a helper. Coiled strip on this mill is continuously cold-roll formed, welded and cut to required lengths in a matter of seconds . . . at speeds up to 340 f.p.m. The quality of the resulting tube is *constantly* better than the requirements of commercial standards. This is one of many reasons why manufacturers and users of tubing the world over are using more Yoder mills than all other makes combined.

If your business requires pipe and tubing, ferrous or non-ferrous, in sizes from ¼-inch up to 26-inch diameter, Yoder can supply the engineering service and machines to produce it faster and better for less! For complete details, write for the Yoder Tube Mill Manual. It's yours for the asking.

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PIPE AND TUBE MILLS
(ferrous or non-ferrous)

FREE TECHNICAL LITERATURE

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 137.

Reminder Calendar

Always forgetting dates, appointments? Well, a new daily reminder calendar lists 144 important meetings, conventions, and educational seminars of interest to electrical men in the industry. (Kaiser Aluminum & Chemical Sales, Inc.)
For free copy circle No. 1 on postcard, p. 137

Fast Fork Truck

A 4-page folder illustrates a 2000-lb capacity fork truck. The truck features fast lift and travel speeds. (Elwell-Parker Electric Co.)
For free copy circle No. 2 on postcard, p. 137

Numerical Control

Numerical positioning control is the subject of an 8-page bulletin. It describes a complete industrial system for automatic point-to-point positioning of machines and machine tools. Benefits are listed, the theory and operation of numerical positioning is explained, and typical applications are discussed. (General Electric Co.)
For free copy circle No. 3 on postcard, p. 137

Air Conveyors

A 32-page product bulletin deals with air conveyors, an automatic answer to bulk handling. It presents detailed technical information on how pneumatic conveying has solved many bulk materials handling problems. System diagrams of typical installations point out the applications and flexibility of these conveyors. Over 70 illustrations are included to show how air transports granular or powdered bulk material efficiently. (Dracco Corp.)
For free copy circle No. 4 on postcard, p. 137

Lock Screws

Principles and advantages of spin-type locking screws are detailed in a 4-page bulletin. Designed to replace separate screws and washers, these one-piece fasteners feature a ratchet-like element which grips the work securely. (Pittsburgh Screw and Bolt Corp.)
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Safety Clothes

Aluminized asbestos safety clothing is described in a 4-page bulletin. Designed for worker comfort and protection on "hot spot" job assignments (i.e., working white hot ingots, coking, slagging, furnace repair) the clothing is light, flexible. (Mine Safety Appliances Co.)
For free copy circle No. 6 on postcard, p. 137

Columbium, Tantalum

Producers and users of high temperature and abrasion-resistant alloys may be interested in a new booklet on columbium and tantalum products. (Shieldalloy Corp.)
For free copy circle No. 7 on postcard, p. 137

Pre-fab Buildings

All-steel standard buildings for industrial sites are outlined in an 8-page brochure. Designed for

swift erection, the new buildings feature pre-engineered sections; these fit together in a wide variety of building types and sizes. Available widths range from 32 to 48 ft, and heights reach to 12, 14 or 16 ft. (Truscon Steel Div., Republic Steel Corp.)

For free copy circle No. 8 on postcard, p. 137

Optical Aids

More than 1000 optical items are listed in a 72-page catalog. Technical data and other information on all types of optical instruments and components are included. Also covered are many industrial quality control tools and instruments. (Edmund Scientific Co.)

For free copy circle No. 9 on postcard, p. 137

Sintered Parts

Advanced powder metallurgy is discussed in a 12-page brochure for designing engineers and management personnel. It describes advantages of powder metal parts; how they are made; and the principles of economical design and production which should be considered. (Dixon sintaloy, Inc.)

For free copy circle No. 10 on postcard, p. 137

Compressors

Horizontal, single stage, heavy-duty compressors are detailed in a 20-page brochure. (Pennsylvania Pump & Compressor Co.)

For free copy circle No. 11 on postcard, p. 137

Structurals

Super-strength structural steels are analyzed in a booklet. These steels possess minimum yield strengths from 55,000 to 150,000 psi. (Climax Molybdenum Co.)

For free copy circle No. 12 on postcard, p. 137

Straighteners

In a 12-page catalog, a company pictures its line of straighteners for flattening ferrous and non-ferrous coiled strip or sheet. There are four types: (1) roll feed straighteners with direct pinion drive, (2) spindle driven roll straighteners,

WILLIAMS

LOCKING ADJUSTABLE WRENCHES

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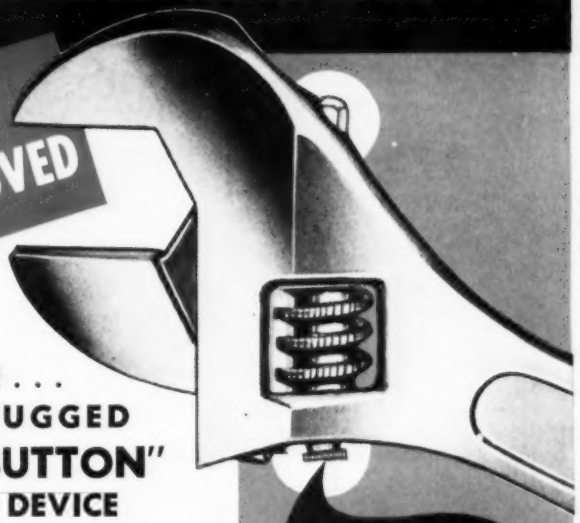

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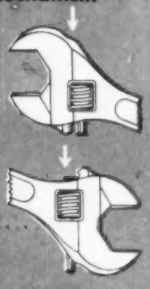
If head of pin is struck directly, pin goes into overshift position.
Upon impact at head of wrench, inertia is stopped by shoulder on bottom of pin.

Featuring exclusive advances in an outstanding design—Williams new improved, patented Locking Adjustable is built to resist the abuse of heavy service commonly associated with this type of wrench. Diagrams point up major improvements in locking mechanism.

Available in 6, 8, 10, 12 and 15" sizes, Williams Locking Adjustables offer rapid, one-hand adjustment and positive protected locking in precision drop-forged construction.

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Malleabrasive reduces overall cleaning costs as much as 50% because—
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These are not just claims. You can prove these savings right in your own plant, in your own machines. We supply all the necessary forms and instructions.
Malleabrasive has reduced costs in more than 800 plants. Why not yours?
make your own 30 day test...
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RESUME OF TESTS
Standard Abrasive vs. Malleabrasive
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FREE LITERATURE

(3) back tension units used in rolling mill operations and (4) special, custom-engineered straightening units. (The Waterbury Farrel Foundry and Machine Co.)

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V-belts

V-belting that reduces vibration and noise by absorbing it before it reaches the machine is reported on in a single-page catalog sheet. It explains how the belt solves vibration problems for air conditioning units, forced air furnaces, window and attic fans, and other belt driven appliances. (B. F. Goodrich Industrial Products Co.)

For free copy circle No. 14 on postcard, p. 137

Hydraulic Press

Air-operated, a new hydraulic shop press is available in four tonnage capacities—25, 50, 75, and 150-ton models. It performs bending, straightening, and other press work rapidly and economically, according to the maker's 4-color bulletin on the subject. (Drake Corp.)

For free copy circle No. 15 on postcard, p. 137

Carbide

A "working" carbide catalog now available tells how to select the proper carbide tool for each particular job. Included are full details on standard carbide tools, standard carbide blanks, lapped toss-away inserts and tool holders. (Besly-Welles Corp.)

For free copy circle No. 16 on postcard, p. 137

Jigs, Fixtures

In its 82 pages, a catalog lists many jigs and fixtures. Full scale templates of all the maker's products are assembled in loose leaf form to simplify removal for detailing and tracing. Products included are: fixture clamps, keys, cams, screws, nuts, washers, handles, hand knobs and hand wheels. (Harco Engineering).

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Only New HALLOWELL *ERECTOMATIC*® Steel Shelving

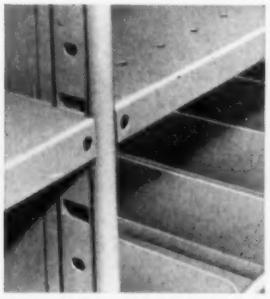
cuts assembly time, permits fast repositioning of shelves —gives you these plus features

STRAIGHT-IN, STRAIGHT-OUT SHELF CHANGE. No tilting. No dismantling. No interference with any other shelf.

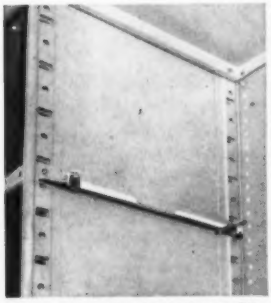
INDEPENDENT SHELF POSITIONING. Each shelf can be repositioned individually in seconds.

FULL USE OF SHELF AREA. No tees or angles, and beaded posts save valuable space.

COMMON SIDE PANELS AND POSTS save material between adjacent units in a rack. Back and side panels are one-piece.



BEADED POSTS AND FLANGED SHELVES prevent snagging of clothing or stored goods, protect workers.

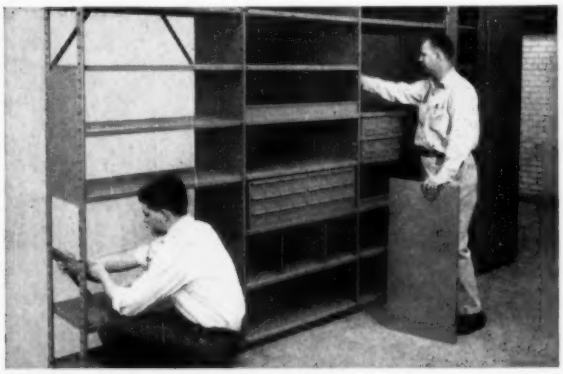


FULL DEPTH SHELF SUPPORT. No buckling possible. Reinforcements can be added when required.

4 CLASSES OF SHELVES. Regular, medium, heavy and extra-heavy construction meets all load requirements.

No matter what type of shelving you need—open, closed, bin units, ledge units, counters or cabinets—new Hallowell ERECTOMATIC® steel shelving makes the job easy. The unique built-in locking device*—developed by SPS—speeds assembly and rearrangement of shelves. To position a shelf, slide it into place on the shelf supports, press the locks, and the shelf is locked. To reposition a shelf, release the locks, pull the shelf straight out, slide it straight in on its supports at the new location, and press the locks. It takes only seconds to do the complete job. Made of prime steel, phosphate coated, and finished in SPS green baked-on enamel—other colors are available. Hallowell ERECTOMATIC steel shelving is stocked by leading industrial distributors and shop equipment dealers. For complete information, see the one nearest you. Or write Hallowell Shop Equipment Division, STANDARD PRESSED STEEL CO., Jenkintown **17**, Pa.

*Patent applied for



TWO MEN ASSEMBLED new Hallowell ERECTOMATIC steel shelving in just over 10 minutes. Closed unit was 36 in. wide, 18 in. deep, 7 ft. 3 in. high, complete with seven shelves. Standard models of other design required 13-55 min. Table shows test results.

Brand	Time to Assemble (Min.)	Units Per Hour
Erectomatic	10.42	5.75
A	13.23	4.53
B	14.24	4.21
C	16.30	3.68
D	18.12	3.31
E	25.03	2.40
F	55.03	1.09

HALLOWELL® SHOP EQUIPMENT DIVISION

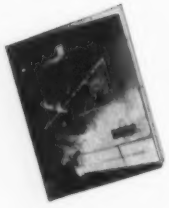
STANDARD PRESSED STEEL CO.

SPS

JENKINTOWN PENNSYLVANIA

ARISTOLOY LEADED BOOSTED PRODUCTION 44%

Lubricating effect permitted faster feeds and speeds



JUST OFF THE PRESS
New Leaded Steel Catalog.
Write for your copy today.

A simple switch from 52100 to 52100 leaded by Universal Engineering Company for this bushing permitted spindle speeds to be increased from 234 to 351 R.P.M. Machine speed was upped from 65 to 90 S.F.M. and feed from .004 to .006 I.P.R. As a result, production of bushings jumped from 89 to 130 pieces per hour. On another bushing, the same lead-treated material increased production from 87 to 124.

In hundreds of like cases, Aristoloy Leaded, the steel with "built-in" lubrication, has helped cut machining time, increased tool life and yielded better finished parts.

Today, Copperweld offers a complete line of leaded analyses and experienced field metallurgists who will be glad to work with you to determine the best Aristoloy Leaded for cutting your machining costs.

COPPERWELD STEEL COMPANY • Steel Division
4001 Mahoning Avenue • WARREN, OHIO
EXPORT: Copperweld Steel International Co., 225 Broadway, New York 7, N.Y.

ARISTOLOY STEELS

FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Tool Bits

High speed steel tool bits are listed in a new catalog. It includes typical analyses of five grades of high speed steel. The bulk of the catalog covers sizes, standard package quantities, weights per package and prices. (Firth Sterling, Inc.)

For free copy circle No. 20 on postcard

Cleaning Compounds

Metal cleaning compounds available from a supplier are reviewed in a booklet. It contains 52 pages on alkaline, acid emulsion and detergent cleaners. (E. F. Houghton & Co.)

For free copy circle No. 21 on postcard

Conversion Compounds

Chemical conversion compounds are discussed in a 24-page booklet. This covers phosphating and blackening materials. (E. F. Houghton & Co.)

For free copy circle No. 22 on postcard

Lathe Tracer

Fast, automatic, precision duplication of parts is done on turret and automatic lathes with a new tracer unit. A dozen-page brochure tells how the tracer slide tool operates. It shows applications on each type turret and automatic lathe in one maker's line. (Gisholt Machine Co.)

For free copy circle No. 23 on postcard

Stainless Plate

A brochure describes an organization that specializes in stainless steel plate products. This outfit shears, saws, flame-cuts, abrasive-cuts or machines plate to customer specifications. (Sandmeyer Steel Co.)

For free copy circle No. 24 on postcard

Steel, Forgings

How a "custom" steelmaker turns out quality steel and steel products is told in a folder. It lists several key advantages of the company: Its ideal location, fine products, adequate facilities, extensive quality control setup, etc. The firm explains why its forgings and other products possess high quality; it makes its own steel, keeps tight quality control through the finish product. (Pencoyd Steel & Forge Corp.)

For free copy circle No. 25 on postcard

Meters, Controls

Instruments introduced during the past year appear in a new 8-page bulletin. The annual publication gives applications, ranges, and other data on transmitting, recording, indicating, and controlling instruments. (Bailey Meter Co.)

For free copy circle No. 26 on postcard

Bushings

Unbreakable malleable split taper compression bushings are covered in a 4-page folder. It explains how a new line of 16 stock spline bore bushings provide a simple, economical way to grip a shaft. (Browning Mfg. Co.)

For free copy circle No. 27 on postcard

Gears

Packed with data on stock gears, speed reducers and roller chain sprockets is a new catalog. (The Ohio Gear Co.)

For free copy circle No. 28 on postcard

No-explode Switch

Double-duty, explosion proof switches are detailed in a data sheet. (Micro Switch Div., Minneapolis-Honeywell Regulator Co.)

For free copy circle No. 29 on postcard

Materials Lifters

Seven new catalogs and bulletins describe one maker's hydraulically-powered material lifting equipment. These outline: (1) a loading dock

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **9/26/57**

Circle numbers for Free Technical Literature or Information on New Equipment:

1	2	3	4	5	6	7	8	9	10
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21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70

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FIRST CLASS PERMIT No. 36 (Sec. 34.9 P.L.&R.) New York, N. Y.

BUSINESS REPLY CARD

No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE
Post Office Box 77
Village Station
NEW YORK 14, N. Y.

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No postage necessary if mailed in the United States

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FIRST CLASS PERMIT No. 36 (Sec. 34.9 P.L.&R.) New York, N. Y.

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **9/26/57**

Circle numbers for Free Technical Literature or Information on New Equipment:

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PLEASE TYPE OR PRINT

Your Name .....

Title .....

Company .....

Co. Address .....

City ..... Zone .....

State .....

FREE LITERATURE

ramp which enables factory trucks to drive onto truck beds; (2) the ramp's advantages and cost-saving features; (3) platform lifts, loading docks, and feed tables; (4) the lifts' specifications for popular sizes; (5) factory truck maintenance lifts; and (6) the maintenance lifts' features and specifications. The seventh summarizes all the firm's materials lifting equipment. (Joyce-Cridland Co.)

For free copy circle No. 30 on postcard

Lift-truck Control

In four pages, a circular describes one firm's recently-introduced control for its electric, walkie-type materials handling trucks. Available as standard equipment on both high-lift and low-lift models, the control offers both dynamic braking and controlled plugging. (Lewis-Shepard Products, Inc.)

For free copy circle No. 31 on postcard

OBI Presses

Two new single back geared presses are covered in a bulletin. It deals with 30 and 37½-ton capacity models. Also reviewed is a complete line of 2 to 85 ton OBL power presses. (Sales Service Machine Tool Co.)

For free copy circle No. 32 on postcard

Roll Markers

A bulletin describes a new process for end face marking screw machine parts by automatic roll markers. The process eliminates costly secondary marking operations. Roll markers adapt to all multiple-station machines. (New Method Steel Stamps, Inc.)

For free copy circle No. 33 on postcard

Liquid Strainer

Self-cleaning liquid strainers are described in a new bulletin. The continuous strainers strain fluids without interrupting the flow for cleaning the screen. Since the screen is constantly kept clean, small perforations of 0.023 in. diam are used, which effectively stop small, troublesome particles. (Golden-Anderson Valve Specialty Co.)

For free copy circle No. 34 on postcard

Blast-Clean Rooms

Airless blast cleaning rooms are dealt with in a 12-page catalog. These rooms are engineered and manufactured for each specific individual application. Rooms vary in size (i.e., one handles a 6-ton railroad diesel engine weldment; another has a 100-ton capacity for cleaning castings). Action photographs show examples of all types. (Wheelabrator Corp.)

For free copy circle No. 35 on postcard

Stamping Presses

Features of 75 to 200 ton high-speed automatic stamping presses are reviewed in a 12-page catalog. These are two-point, back gear, union drive presses. (Alpha Press & Machine, Inc.)

For free copy circle No. 36 on postcard

Burnishing

Latest addition to one company's barrel finishing materials is the subject of a service report. Specially compounded to improve brightness of work, the material develops very good color and luster on brass, copper, nickel-silver, gold, and mild and hardened steel parts. It works with media or with self-tumbling work. (Oakite Products, Inc.)

For free copy circle No. 37 on postcard

Portable X-ray

Portable industrial x-ray units are described in a folder. These high powered units provide for 360° and single window radiography of pipe lines, tanks, boilers, castings, etc. (Mitchell Radiation Products Corp.)

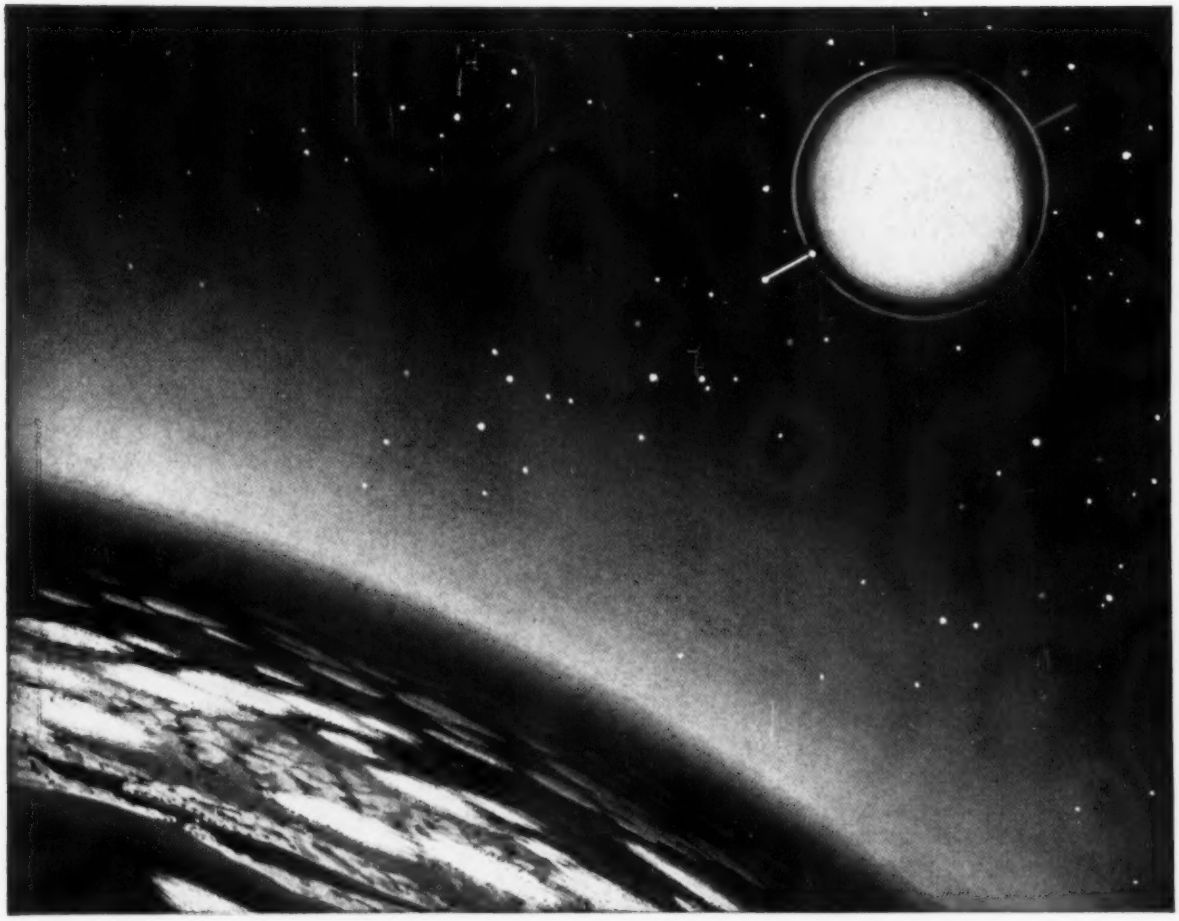
For free copy circle No. 38 on postcard

Core Drillers

Core drilling units drill masonry quickly, with ease. A folder describes them. (Diamond Products, Inc.)

For free copy circle No. 39 on postcard

A Touch here achieved so much



CHARTING THE WAY TO THE STARS...

A new iridescent point of light flashing through our skies at night will proclaim man's most radical step since the invention of the wheel. The Earth Satellite will be on course, electronically compiling information that will enable man to chart his way to the stars.

The electronic equipment will be housed in a sphere 20 inches in diameter. The sphere will be made in two parts, from a magnesium alloy, deep-drawn after spraying with 'dag'® 41, a colloidal graphite dispersion. A thin film of colloidal graphite covers the pre-heated sheets before insertion in the drawing press.

Final contour is achieved by spraying the hemisphere again with 'dag' 41; then spinning under torch heating and wood tooling until the hemisphere assumes the shape of the spin block. Both hemisphere and spin block are coated with 'dag' 41 to facilitate removal.

'dag' 41 prevents galling, scoring and metal pickup; its ease of application, film strength, lubricity and resistance to heat make it the perfect deep-drawing lubricant. Talk with your Acheson Service Engineer soon, for more detailed information, and write for Bulletin 426—Metalworking Applications. Address Dept. IA-9.

dag®

ACHESON COLLOIDS COMPANY

Port Huron, Michigan...also Acheson Colloids Ltd., London, England

ACHESON COLLOIDAL DISPERSIONS:

Graphite · Molybdenum Disulfide · Zinc Oxide · Mica and other solids

Offices in: Boston · Chicago · Cleveland · Dayton · Detroit · Los Angeles
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NIAGARA SECTIONAL *Aero* HEAT EXCHANGER

gives close temperature control, saves you

LABOR, Power, Water

● The NIAGARA *Aero* HEAT EXCHANGER transfers the heat from the quench bath to atmospheric air. It never fails to remove the heat at the rate of input, giving you real control of the quench bath temperature. This prevents flashing of oil quenches. In all cases it improves physical properties, saves loss of your product from rejections and gives you faster production, increasing your heat treating capacity. You can put heat back into the quench bath to save the losses of a "warm-up" period.

Savings in piping, pumping and power as well as great savings in cooling water return the cost of the equipment to you in a short time. The Niagara *Aero* Heat Exchanger saves nearly all of the water consumed by conventional cooling methods.

Use Niagara Aero Heat Exchangers also to cool and control temperature of furnace jackets, induction heaters, welders, wire drawing and extrusion dies, rolls, transformers, engines and all plant water cooling systems.

For the complete story of other benefits and savings, write for Bulletins 120 and 132.

NIAGARA BLOWER COMPANY

Dept. IA-9-2, 405 Lexington Ave.
NEW YORK 17, N. Y.

District Engineers in Principal Cities of U. S. and Canada

TECHNICAL BRIEFS

Dissolves Tin In Germanium

Electrical semiconductor materials are generally very sensitive to impurities.

But recent tests show certain impurities don't affect some materials. In one study, researchers obtained germanium containing tin. The tin didn't alter the material's electrical characteristics.

▪ Semiconductor materials in general are extremely sensitive to the presence of impurities. Some researchers have long theorized, however, that impurities with the same number of valence electrons as germanium would be neutral. This means that they would act as neither donors nor acceptors if present in germanium. Experimental evidence recently obtained by Bell Telephone Laboratories, New York, verifies this theory.

Working with tin and germanium, both of which had been highly purified by the laboratories' zone refining process, scientists have been able to obtain single crystals of germanium containing tin at concentrations greater than 10^{19}-10^{20} atoms per cubic centimeter.

Bears Out Theory—The crystals exhibited room-temperature resistivities of 30 to 50 ohm-centimeters. This is practically the same as ultrapure germanium. Thus, it proves that the tin did not significantly alter the electrical characteristics of the germanium.

Long lifetimes in these crystals, as high as 100 to 200 microseconds, also indicate that tin atoms definitely are not effective hole-electron recombination centers.

Germanium Crystals Grow — Germanium crystals containing several hundredths of an atom per cent tin were grown by the pulling technique from melts containing

Researcher prepares to insert a sample into an oven.

the appropriate percentage of tin. For a higher tin concentration, a process was used which takes advantage of the fact that the solubility of germanium in molten tin increases with temperature.

Germanium is dissolved in tin at a given temperature and precipitated or grown on a seed crystal

Want More Data?

You may secure additional information on any item briefed in this section by using the reply card on page 137. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

at a lower temperature. This may be several hundred degrees below the melting point of germanium.

Chemical analysis of the crystals grown by the latter method, after dissolving excess tin, showed a solid solubility of tin in germanium as high as one atom per cent. Precise x-ray measurements of the lattice constant showed that the tin is indeed in solid solution.

Produces Sand Molds Via New Technique

A new process makes semi-precision sand molds for metal castings using carbon dioxide and a sodium silicate-based binder.

Developed by National Cylinder Gas Co., the new process is said to combine close-tolerance aspects of shell molding and the time-and-money saving advantages of the CO_2 foundry process for conventional sand cores. It handles virtually all castable metals. Castings are produced with tolerances in the semi-precision range. So reports the company.

Chemical Hardens—The process uses carbon dioxide and a sodium silicate-based binder to produce a chemical reaction that hardens sand molds in 15 to 30 seconds. Sodium silicate and fine sand in grain sizes from 100 to 180 AFS are mixed and the mixture is rammed into a mold pattern.

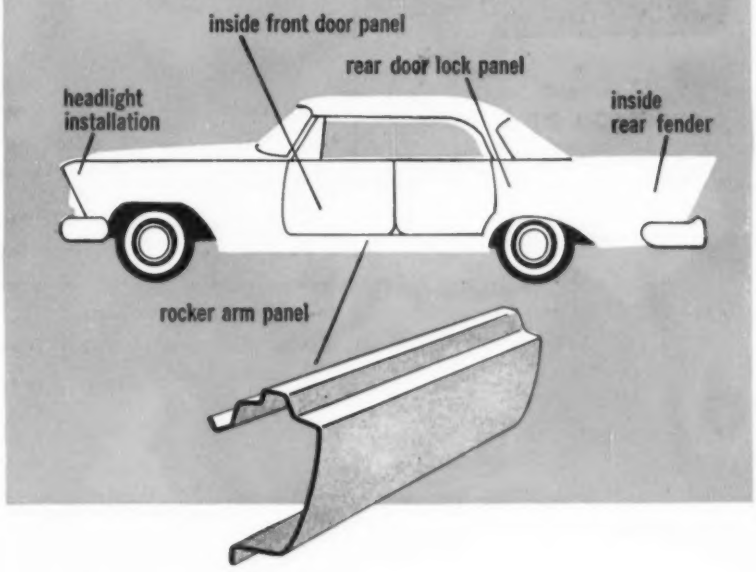
Gassing with CO_2 forms a silica gel that coats the grains of sand and bind them firmly. Molds as thin as ½ in. are practical, the company reports.

Room Temperature Process—All operations in the production of CO_2-hardened semi-precision molds are carried out at room temperatures. This makes possible the use of inexpensive aluminum or plastic patters.

In addition, molds produced by the new process lessen the chance of thermal shock. Such shock might result in castings with surface imperfections. They resist this because the CO_2-hardened sands have an inorganic bond that withstands

NOW! a weldable corrosion-resistant coating

Zincilate 400



IT'S NEW! Zincilate 400 was used first by the automotive industry on the late 1956 models.

IT'S PROVED! Zincilate 400 is now being used by more manufacturers, in more crucial areas, on the 1957 models.

IT'S EXCLUSIVE! Only Zincilate 400 can be applied before fabrication, then welded, minutes or months after application. You'll get fast, clean work — anytime — when you weld over a Zincilate 400 coating, because it retains its conductivity and contains no chemicals to contaminate electrodes. And, note this — Zincilate 400 provides galvanic protection, even at the point of burn-off, that keeps corrosion shackled.

You can use Zincilate 400 on your product, applying it as the automotive people do, by spray, brush or dip, before fabrication and welding. Your product, if it's made of metal, will be protected — always — by Zincilate 400.

Cost? You'll find many coatings with a lower first cost. But overall costs, where it really counts, are lowest when you're using Zincilate 400. If you'll outline your problem, we'll be happy to tell you just what you can expect of Zincilate 400—and there's no obligation.

Zincilate

CORROSION-RESISTANT, ABRASION-RESISTANT, WELDABLE, AIR-DRIED and BAKED PROTECTIVE COATINGS

INDUSTRIAL METAL PROTECTIVES, INC., 402 HOMESTEAD AVE., DAYTON 8, OHIO

TOCCO Chose Reading Electric Hoists ...

This Reading electric hoist is moving a sheet metal cabinet from a heating station to the production line. All Reading hoists at Tocco have the same two-button pendant control.

● Rapidly rising production goals are being met in Ohio Crankshaft's new Tocco Division plant in Cleveland's South Side . . . thanks partly to Reading Electric Hoists.

Tocco, a leading producer of induction heating equipment, designed the new plant to meet the needs of its rapid expansion. Pre-planned materials handling, involving trucks, bridge cranes and electric hoists, is paying off in fast, orderly movement of materials from operation to operation.

Playing a big role in this integrated handling system is a series of Reading electric hoists, "custom-built" from standard Reading units to meet the exact requirements of each operation. These hoists permit Tocco workmen to move all material without manual lifting.

Reading's unique "Unit Construction" plan offers you special equipment for your own plant at the low cost of standard parts. Investigate now this proven way to get faster, better materials handling. A note on your company letterhead will bring a Reading engineer to analyze your handling operations . . . at no obligation.

Reading Crane & Hoist Corporation, 2103 Adams St., Reading, Pa.

READING HOISTS

CHAIN HOISTS — OVERHEAD TRAVELING CRANES — ELECTRIC HOISTS

extremely high temperatures of molten metal.

Little capital investment is required, the company points out, to make use of the new process. It requires only a CO_2 gas supply, regulating equipment, gassing heads, an inexpensive sodium silicate binder and inexpensive patterns.

Successful Foundry Tests — Full scale foundry trials in Akron, O. and Tulsa, Okla., have produced semi-precision molds with very good accuracy and finish. One firm reported tolerances of ± 0.002 to 0.004 in. per in. Another says it easily holds 0.010 in. per in. tolerances in casting highly configurated impellers.

Under quantity production procedures semi-precision molds by the CO_2 process can be produced at relatively rapid rates on automated production lines.

Welds Ti Parts In Portable Bubble

Portable and highly resistant to tearing, a plastic bubble helps one firm weld titanium parts. The bubble, of cast vinyl plastic, holds an inert argon gas atmosphere.

Lightweight and easy to fabricate, the plastic tent is transparent and flexible. Yet, it has a very low gas transmission rate.

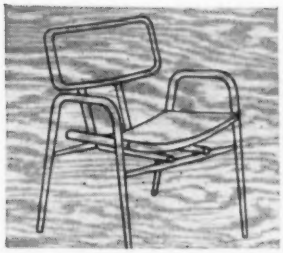
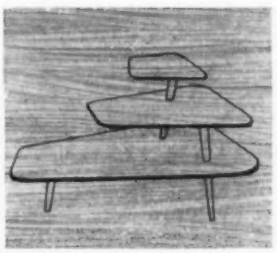
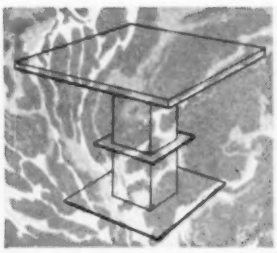
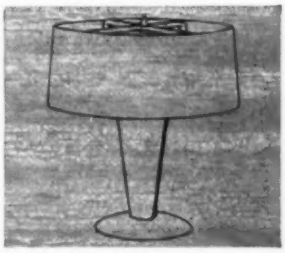
Welds Engine Parts—Used in welding titanium engine parts at Pratt and Whitney Aircraft Div., United Aircraft Corp., East Hartford, Conn., the tent keeps out unwanted gases, including oxygen. Oxygen causes impurities to occur at the joint when welded. By filling the welding chamber with inert gas, the possibility of producing welds without impurities improves.

Argon - holding plastic bubbles used by the aircraft company measure about 4-ft high and 4-ft in diam.

Pipes Gas In—To weld titanium engine parts inside the tent, argon

RIGIDIZED TUBING BY STANDARD

customized for you in "1001" patterns

For volume users of tubing—

Hundreds of exciting new patterns in rigidized tubing can be made up to add novel beauty, strength and individuality to your products. Textures and motifs to match fabrics, woods, materials and finishes of all kinds. In round, square, rectangular or special shaped tubing. And manufacturer sharing the cost of design development depending, of course, on volume of order. Custom patterns such as—nubby weaves, rustics, striateds, knotty pine, corrugated, herring-bone, ripple wood, swirls, scrolls, geometrics—can be designed to your specifications. Gleaming chrome or duo-tone enamel finishes. Unlimited pattern designs! Unlimited uses! You are limited only by your own imagination. Sizes range from ½" to 5½" OD in 16 gauge and lighter carbon steel tubing . . . and to 4" OD stainless steel.

Standard also offers full line of carbon and stainless tubing and pipe—for everything from simple *structural* to precision *mechanical* and *pressure* applications.

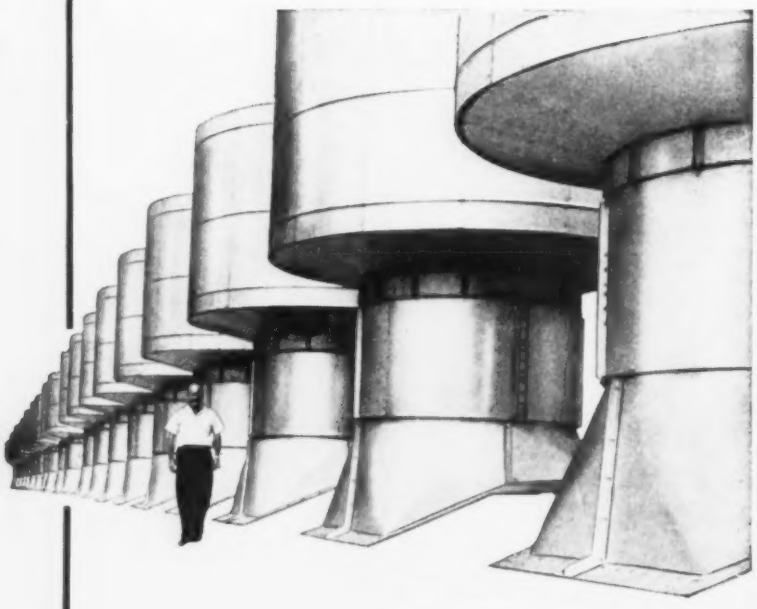
FREE 8-page folder on all Standard products. Write to address below.

STANDARD

THE STANDARD TUBE COMPANY

24400 PLYMOUTH ROAD • DETROIT 39, MICHIGAN

Welded stainless tubing and pipe • Welded carbon steel mechanical • Boiler and Heat Exchanger • Exclusive rigidized patterns • Special Shapes • Steel Tubing—Sizes: ½" OD to 5½" OD —.028 to .260 wall • Stainless—Sizes: ¼" OD to 4" OD—.020 to .154 wall.



29 BURT FREE FLOW FAN VENTILATORS DO DOUBLE DUTY ON THIS STEEL PLANT

In this large steel plant, huge volumes of fumes and heated air must be exhausted during certain operations —lesser amounts during other production. Twenty-nine 72" Burt Free Flow Fan Ventilators with individual capacities of 81,000 CFM meet *both* needs efficiently. Burt Axial Flow cast aluminum fan wheels powered by 15 HP, 860 RPM Class B insulated motors, with shrouds and ventilating tubes, supply adequate air movement at peaks. At other times, their high wind band design provides extremely high air handling capacity as a gravity unit without the fan operating. If YOU need fresh air at low cost, let Burt engineers suggest—without obligation —the Burt Ventilators to do your task best.

Send for **FREE** *Data Book!*

Write for Burt Data Book SPV-17. It supplies quick data on Burt's complete line of modern Wall Louvers

FAN & GRAVITY VENTILATORS • LOUVERS • SHEET METAL SPECIALTIES

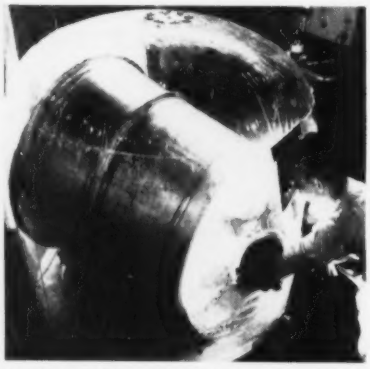
The Burt Manufacturing Company

920 So. High St. Akron II, Ohio

MEMBER POWER FAN MANUFACTURERS ASSOCIATION

gas is piped in. This forces atmospheric air out through several small valves at the top of the bubble. The slightly higher pressure of the argon gas keeps the chamber inflated.

Sleeves with attached gloves are built into the tent. They prevent gas from escaping while providing



Inside this plastic tent is an inert argon gas atmosphere

the welder ready access to the part. He views his work through a shield which filters out the harmful glare of the electrode.

Pioneer Valley Plastics Co., Chicago, fabricates the tents. Bakelite Co., New York, supplies the Krene plastic material.

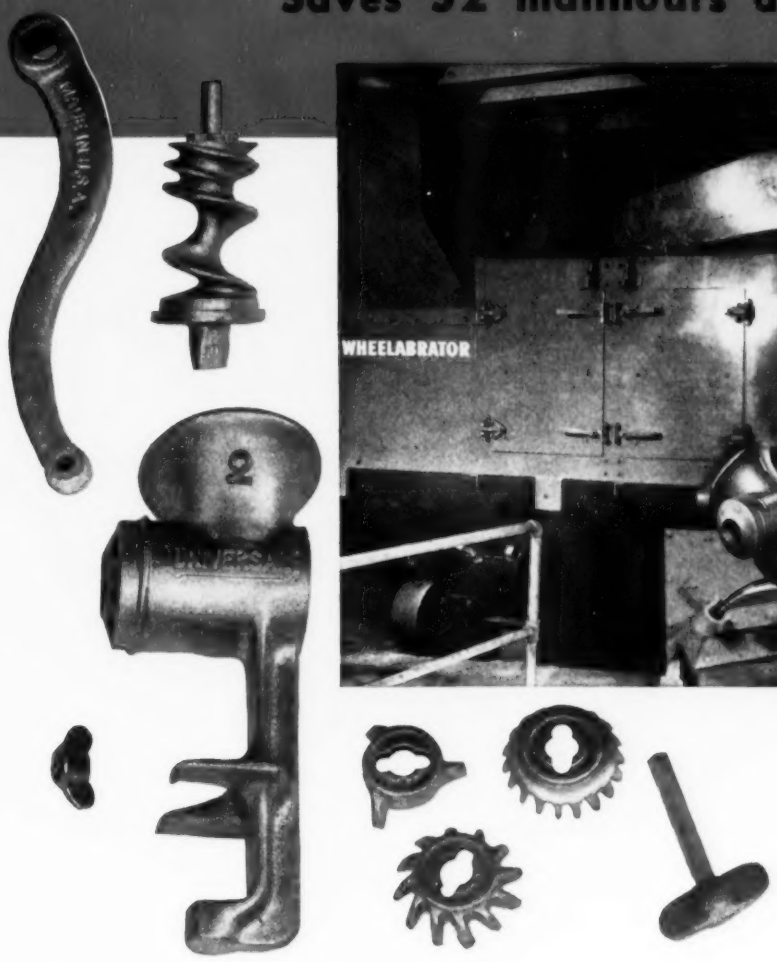
Guards Against Fumes

Self-powered, automatic safety controls help a manufacturer of laboratory equipment provide protection against dangerous chemical fumes.

At the firm's plant, metal parts are thoroughly cleaned in several 3x5 ft vapor de-greasing tanks prior to plating. Parts are lowered in baskets into 5-ft deep tanks; here, trichloroethylene vapors remove dirt, dust, grime and grease.

Heats Solvent—Heating coils in the lower portion of the tank bring the chemical solvent to a temperature at which it vaporizes—about 120°F. The top of the de-greasing tank is surrounded with coils containing cooling water used to con-

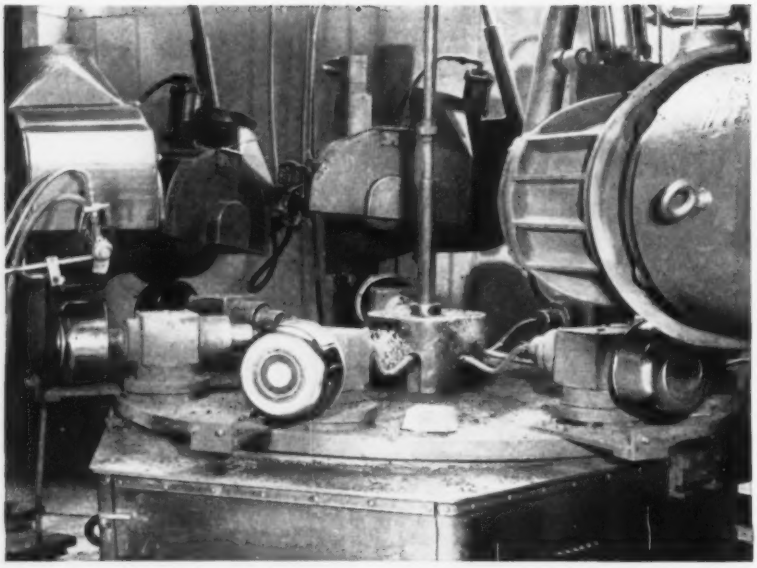
WHEELABRATOR® Continuous Tumblast
Replaces 2 batch-type machines
Saves 32 manhours daily



An immediate reduction of 32 manhours daily was effected at Landers, Frary & Clark, New Britain, Connecticut, with the installation of a Wheelabrator Continuous Tumblast for cleaning gray iron components for UNIVERSAL food choppers. Two batch-type mills were replaced with this machine that requires no operators. Other advantages obtained as reported by Mr. Arthur Cherwin, Foundry Supt. are: "A three-fold production increase, shot reduction of 40%, and a high degree of surface cleanliness."

There's a Wheelabrator machine for every foundry cleaning problem.
Write today for information. Ask for a copy of Catalog 143-D.

WHEELABRATOR CORPORATION
510 SOUTH BYRKIT STREET, MISHAWAKA, INDIANA
WORLD'S LARGEST BUILDERS OF AIRLESS BLAST EQUIPMENT



DORMEYER Corporation finds...

Automatic finishing with 3M "PG" Wheels cuts costs 66%

Dormeyer Corporation, nationally known Chicago appliance manufacturer, was using sisal buffs on a six-station rotary automatic machine to finish their stainless steel mixing bowls. This method was expensive, with daily production averaging 2200 finished bowls, and many rejects.

A 3M Engineer suggested that this company install 3M "PG" Wheels (made of hundreds of pieces of die-cut coated abrasives) on the first three stations of the automatic machine; a Grit #280 "PG" Wheel at the first station, a Grit #320 at the second and a Grit #400 at the third, all lubricated with liquid tripoli. The last three stations remained color buffs.

Results: production increased nearly 25% to 2900 finished units per day, and rejects were eliminated! Each "PG" Wheel finishes an average of 50,000 bowls—compared to 1700 for each sisal buff—thus cutting down-time to a minimum. Over-all finishing costs were cut 66%.

PERFECTLY ADAPTED TO AUTOMATIC FINISHING

If you now have or are planning to install an automatic finishing operation, it will pay you to get full facts on the 3M "PG" Wheel. Call your 3M Representative today, or send the coupon below.

3M ABRASIVES

WANT MORE INFORMATION?

Minnesota Mining and Manufacturing Co.
Dept. DD-97, St. Paul 6, Minnesota

☐ Send me full details about 3M "PG" Wheels
☐ Please have a 3M Representative call

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PRODUCT OF 3M COMPANY RESEARCH

dense these vapors which are considered hazardous. Any malfunction of either heating or cooling coils can cause the vapors to overflow, although they are heavier than air.

To control this potentially dangerous situation, the manufacturer installed a safety control device. The control, designed by Robertshaw-Fulton Controls Co., Knoxville, Tenn., is a simple, self-operated unit requiring no air or electricity for its operation.

Triple Protection—Steam to the heating coil of the cleaning solution feeds through a valve which is triggered by the safety mechanism. The pressure element of the safety device is connected to the cooling water supply line. A thermal bulb is installed above the condensing coils. On failure of cooling water supply, the safety control will trip, thereby closing the steam heating supply.

A second safety feature of the control trips the instrument in case the dangerous vapors rise above the condensing coils for any reason. Finally, if the sealed thermal system of the safety control is damaged or otherwise loses its charge, the degreasing unit shuts itself off automatically.

Anodizes Quickly

Anodizing of aluminum automobile grills and body trim is being handled at a 5000 sq ft per hour clip by a new setup. Key figure in the system is a heavy-duty machine that permanently anodizes aluminum any color at production rates.

Resulting anodized aluminum can be etched, brushed, buffed or treated in a variety of ways to create an almost unlimited number of textures and colors. It can be dulled to a matte finish or chemically brightened to resemble chrome.

Contains Many Solutions — In use at Firestone Steel Products Co., Akron, Ohio, the anodizing machine contains 21 different sequence solu-

tions. Aluminum to be processed is automatically immersed in each solution the correct length of time. Six different finishes can be turned out simultaneously. While the anodizing equipment is capable of processing an unlimited number of different finishes, current production is for passenger car grills and panel trim in color for popular models in high production.

Bins Under Furnaces Speed Ash Disposal

Scale and ash created by a battery of new furnaces are hauled away quickly and simply. A unique disposal setup gets the credit for this.

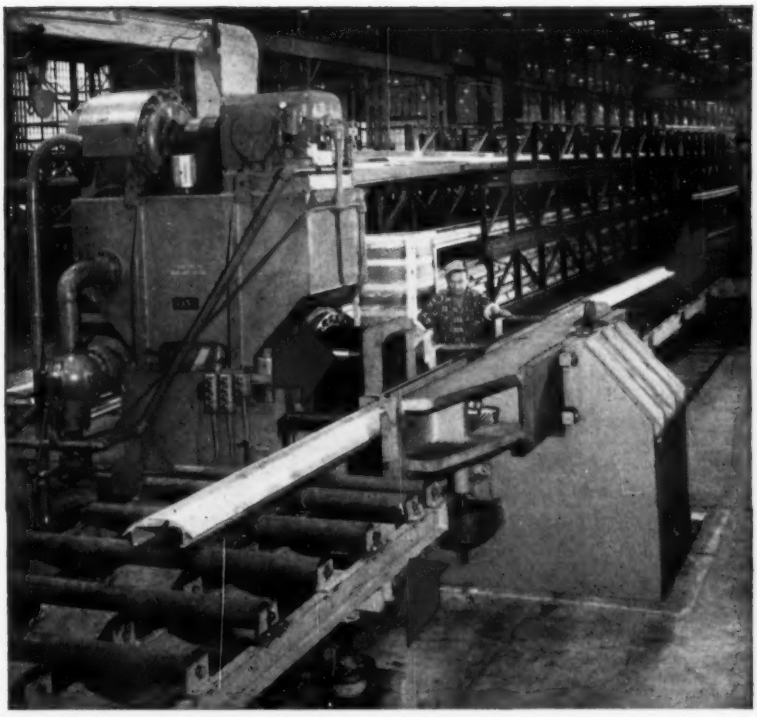
Used in conjunction with two batteries of four new soaking-pit units, the disposal system is part of a new 10,000 sq ft installation

Ingot rises from pit; ash and scale fall to bin below

at Allegheny Ludlum Steel Corp's Brackenridge Works. The advanced design, gas-fired furnaces boost the firm's soaking-pit capacity considerably. They also up scale and ash output.

Carries Ash Away—To dispose of this scale and ash, the plant employs an original arrangement. Beneath the refractory-lined furnaces, which hold ingots for several hours, are numbered bins. These bins catch the matter falling from the soaking-pit furnaces above.

After the bins collect the scale and ash, an electric truck and crane removes them. From here they are



Live-roller conveyor moves work into press. Conveyor moves up or down to position work in die. Ram moves forward to straighten work. Entire installation, including press and conveyor, designed and built by Farquhar.

Kaiser Aluminum uses this Farquhar HORIZONTAL BULLDOZER PRESS for fast-cycle straightening

Aluminum extrusions, fed *continuously* to the press on Farquhar Live-Roller Conveyors, are straightened in a *fast-cycle operation* on this Farquhar 500-ton Horizontal Bulldozer Press. This efficient set-up is installed at the U. S. Air Force Heavy Press plant operated by Kaiser Aluminum & Chemical Corporation in Halethorpe, Maryland. In their own words this press is used "to eliminate natural bows and deformations which develop in some aluminum extrusions after they have been heat treated."

Like Kaiser Aluminum, major plants in this country have found that these Farquhar Horizontal Bulldozer Presses provide high production at low unit cost. Fed either by crane, overhead or in-line conveyors, they are used to economically forge, stamp, straighten or form parts in an efficient, fast-cycle operation.

Write for complete information on Farquhar Horizontal Bulldozer Presses or, better still, ask for our proposals or recommendations.

Farquhar Special Machinery Department . . .
Our qualified staff will build your special machinery economically—your inquiry will receive prompt attention.

A. B. FARQUHAR DIVISION
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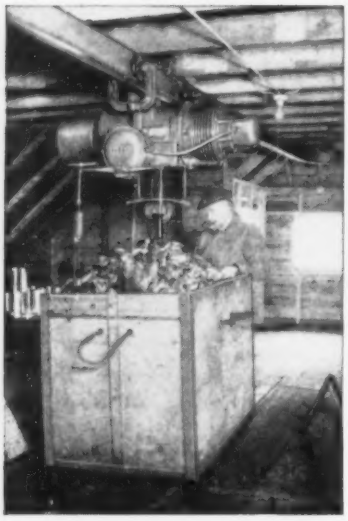
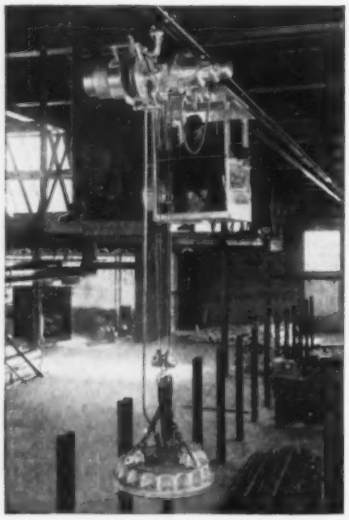
Farquhar PRESSES
Also Manufacturers of Farquhar Conveyors

WHICH HOIST
fits your plant's needs?



SHEPARD NILES
FLOOR-OPERATED HOIST

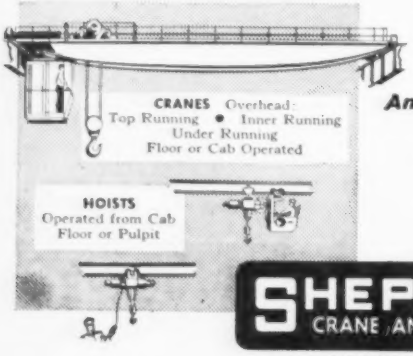
Operator primarily occupied with other duties. Uses hoist for fast, efficient handling of relatively short hauls.



SHEPARD NILES
CAB-OPERATED HOIST

Operator in cab moves loads along at high speeds, occupies best vantage point for spotting and stacking material.

THE RIGHT HOIST . . . can reduce your plant's handling costs. But which one is best for the job . . . a floor-operated hoist where the operator is freed for other duties or a cab-operated hoist where he is engaged fulltime moving loads through the air? Because Shepard Niles manufactures both types of hoists . . . as well as a complete line of cranes . . . we can approach your handling problem with an open mind.



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1472 Schuyler Ave., Montour Falls, N.Y.

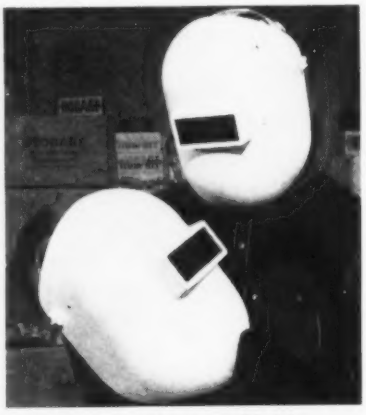
loaded into a dump truck which carries them to the dumping grounds.

The entire setup, including the modern furnaces, are part of a company program to bring stainless and electrical steel finishing facilities into balance with its steel-melting capacity.

Color Weld Helmets Identify Welders

Colored welding helmets have been worn for some time by many welding men. Others view them as something relatively new. New or not, colored welding helmets on welding operators are finding an increasing use.

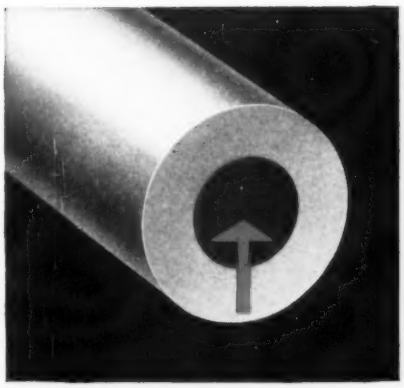
Colors are considered by some as merely recognition of fashion, but Hobart Bros Co., Troy, Ohio finds differently. According to this maker of welding machines and accessories, colored welding shields provide an excellent safety factor. They help identify welders working in dangerous areas or among moving objects.



Bright, easy-to-see shields can be an important safety factor.

Old Ideas, Too — Of course, colored shields also provide an easy means of personal identification to those who desire it. This has been the case for many years. Heretofore, operators painted or marked their shields for personal

a hole here makes waste...



a hole here saves waste

Crucible Hollow Tool Steel cut sections eliminate the waste and cost of drilling out solid rounds to make ring-shaped or tubular steel parts, or tools with a center hole. By using these hollow bar sections, cut to length, you do away with unnecessary cutting, drilling, and boring operations, increase machine capacity, and cut scrap losses.

These hollow sections, in just about any O.D. and I.D. combination, or thickness you want, are *immediately* available in five most popular Crucible grades: KETOS oil hardening, SANDERSON water hardening, AIRDI 150 high-carbon high-chromium, AIRKOOL air hardening, and NU DIE V hot-work tool steels.

Call your nearby Crucible warehouse for more information, or for speedy delivery. *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

CRUCIBLE first name in special purpose steels

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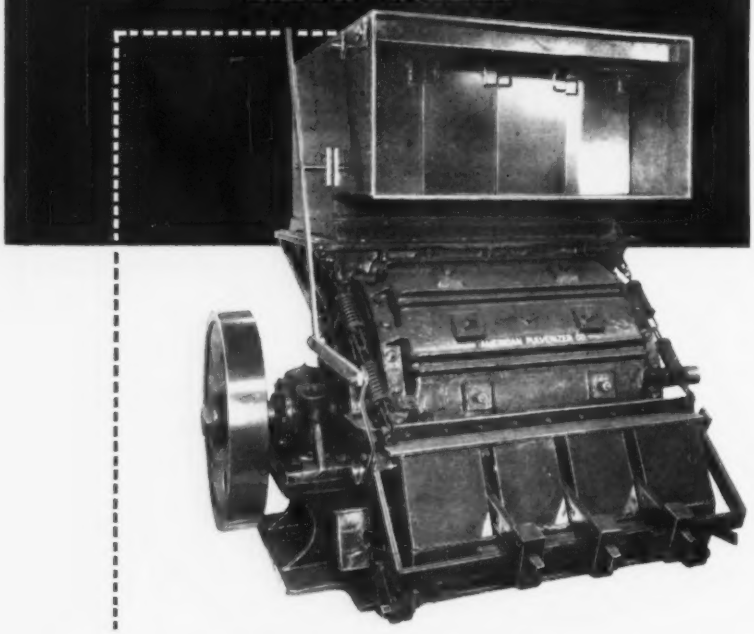
convert metal turnings into cash

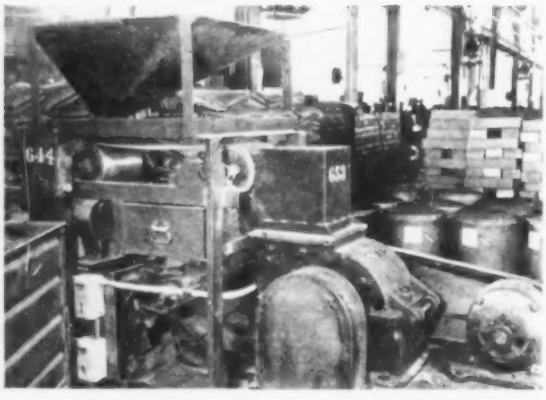


Long, curly, troublesome metal turnings, reduced in an American Metal Turnings Crusher, can produce additional profits for your plant.

Reduced to chip form, metal turnings bring $2 to $5 more per ton. Handling metal chips by shovel or pneumatic systems is easier, too, and chips require **75% less storage** space than bulky machine turnings. You'll recover more cutting oil from chips . . . up to 50 gallons per ton! More important, American Metal Turnings Crushers pay for themselves and produce substantial profits for years to come. Models available with capacities ranging from 1 to 50 tons per hour. To get all the details, write American today.

reclaim fused welding flux

One industrial plant saved more than $10,000 a year by using an American Welding Flux Crusher to regranulate fused welding flux. Write American for details.



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TECHNICAL BRIEFS

identification. As the paint wears off or becomes scuffed, repainting is necessary. This explains why some welding departments use more paint than thought necessary.

Such old fashioned ideas of coloring welding helmets can now be abandoned. Instead, Hobart has introduced a shield with the color "built in." Made of Fiberglas impregnated with polyester resin, the helmets come in many hues. Polyester resin, a liquid plastic, becomes very hard when combined with the glass fibers and cured. It displays excellent thermal, anticorrosion and electrical characteristics.

Other Assets—The manufacturer reports that the plastic gear has other advantages, too. Helmets are lightweight, fit well—and they are cool, especially in the lighter colors. This is because the colors reflect not just heat but also ultraviolet rays of the arc.

Helmets come in gray, blue, red, green, yellow and white.

Slide Tool Tackles Tracer Problems

If you're looking for an economical machining method for handling both complex and simple jobs, then maybe tracing is for you. A tracer controlled lathe offers high production capacity for complex work. Sometimes it cuts the cost of both complicated and standard work.

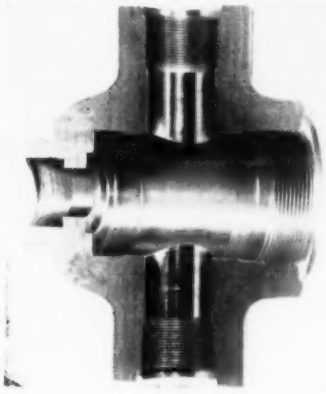
A typical modern tracer setup is a Gisholt saddle type lathe equipped with a tracer slide tool. This machine tool handles complex jobs involving difficult turning or boring operations. The slide tool operates equally well on a fixed center or cross feeding turret type lathe.

Other Tools Free—The stylus on the tracer slide follows a flat template held on the carrier bar and has micrometer adjustment for minor diameter changes. Template and carrier obtain longitudinal lo-

cations from an adjustable bracket attached to the overhead pilot bar. The entire assembly indexes with the turret and does not restrict use of other tooling.

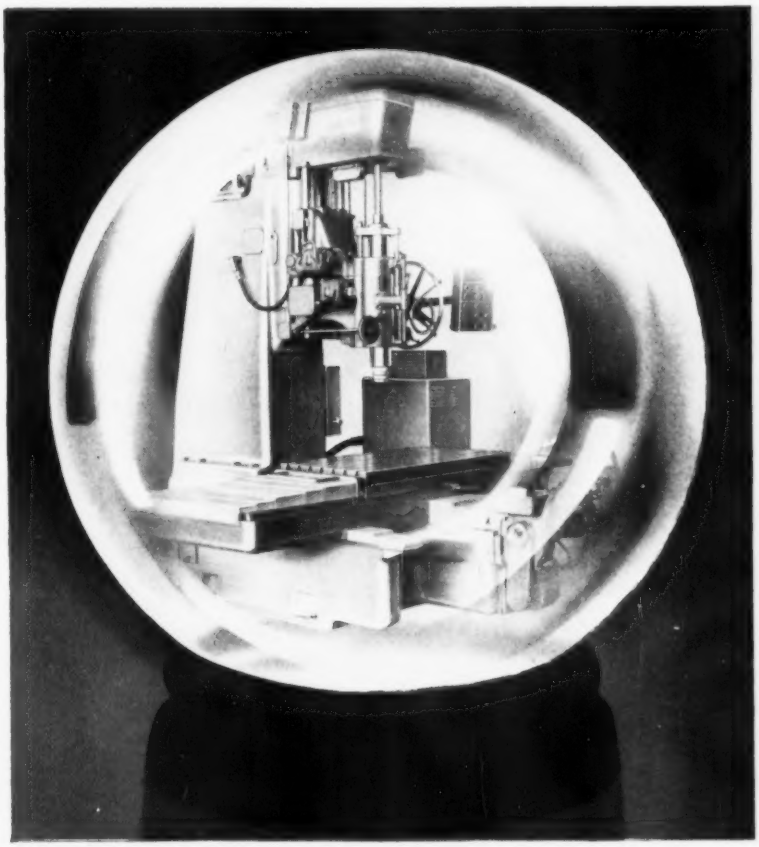
Special features provided on the lathe include a four-position manually indexed fixture; an eight-sided turret equipped at one station with a tracer hydraulic unit; and a full length lead screw and universal selective gear box for threading. Twenty-four spindle speeds from 15 to 800 rpm are available. A 50-hp main drive motor furnishes power for cutting.

How It Works—The workpiece is a 2-in. screwed end type steel valve body. After the workpiece is located and chucked in the fixture, the sequence of operation is as follows: One end is faced and chamfered; another is rough bored to start the operation. A 90° indexing of the fixture presents still another end for facing and chamfering. The bore is rough and finish machined and tapped with a Landis collapsing tap. Next, the fixture is indexed 180° permitting similar operations to be performed on the opposite end.



Cutaway view shows complexity of the workpiece.

Then, the fixture is indexed 90° and an end is faced, chamfered, turned, undercut, and externally threaded with a self-opening die head. With this station, the stepped bore is also machined. For the last operation, the work holding fixture is indexed back to the starting position. Then the end face and all



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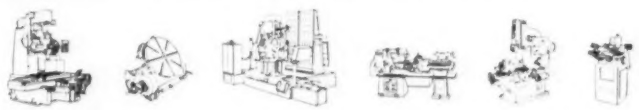
You *don't* need a crystal ball for a look at tomorrow's profits. Just take an appraising look at your present machine tools and other plant equipment. The *only* way you can improve your competitive position and increase your profit margin is to reduce your production costs. If your present machines aren't up-to-the-minute . . . with everything it takes to produce faster, more efficiently and economically . . . you *can't* expect a bright profit future. To insure tomorrow's profits, you must invest *now* in the latest and finest.

The new Pratt & Whitney Extended Payment Plan makes it *easy* for you to replace immediately with new P&W Machine Tools. Your new profits will more than take care of the convenient installments that pay for the machines.

Write now for your copy of the booklet *"New Machines Make New Profits." Pratt & Whitney Company, Incorporated, 10 Charter Oak Boulevard, West Hartford, Conn.*



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bores, counterbores, steps and faces in another bore are machined in one pass by means of the tracer slide tool on the turret.

Stylus Moves Up, Down — The stylus mounted on the body of the tracing slide moves up and down with the forward longitudinal movement of the turret along the flat template mounted on top of the stationary cam carrier. This is clamped at the end toward the headstock of the lathe and supported at the other end by a split bracket. At the completion of this boring operation, the cam carrier bar is unclamped at the headstock end and pushed back through the bracket on the slide tool. In this position, the cam carrier bar offers no interference to the rest of the tooling.

The floor-to-floor time for this job is 25 minutes.

Vacuum Melt Unit Aids Reactive Metal Study

Precise investigations on titanium, other reactive metals and new missile materials will be carried out by Watertown Arsenal, Watertown, Mass. with the help of a new 500-lb capacity vacuum melting furnace.

Installed in the arsenal's Gen. Thomas J. Rodman Laboratory, the unit was built by F. J. Stokes Corp., Philadelphia. It is designed to produce metal of extremely high purity, free of slag inclusions and trapped and dissolved gases.

How It Does It — The furnace does this by induction-melting a charge of ordinary metal and the desired alloying constituents within a high vacuum. Refining this melt by pumping out any gases which may be contained within the raw stock brings about the desired result.

After purifying, the metal is poured from the crucible into small ingot molds while still under vacuum. A 36-in. turntable within the vacuum chamber permits several molds to be poured at one time without breaking vacuum.

Some Features—The furnace incorporates devices for making bulk additions of alloying constituents at the proper time during the melt. It does this through pre-loaded hoppers within the vacuum chamber; these are filled at the time the main charge is loaded into the crucible.

A vacuum lock at the chamber top provides for breaking any "bridges" that form on the upper surface of the molten metal in the crucible.

Pumps Down Fast — Rapid pumpdown of the arsenal's furnace is provided by a special pumping system. This incorporates diffusion and booster-type oil-vapor pumps and a 500-cfm rotary mechanical vacuum pump. These can bring the pressure within the chamber down to a level of 1 micron or less within 16 minutes.

Fast installation was pre-planned in the design of the unit. As a result, the furnace was set in place and put completely in operating condition in only six working days. Four men, working under the supervision of an engineer, were all that were required for the installation.

Purifies Metals

A simple, inexpensive way to get pure high melting point metals has been developed at Illinois Institute of Technology. The process produces titanium, zirconium, chromium, halfnium, niobium, and vanadium directly from their oxides.

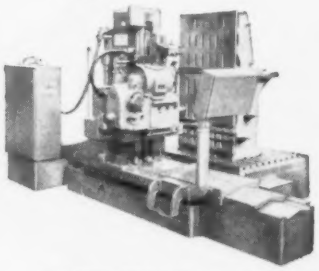
In the new method, oxides of the metals to be produced are reacted with aluminum under conditions which completely remove all oxygen.

Speeds Grinding

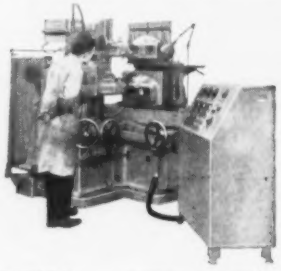
An unusual bench-mounted fixture helps a firm speed grinding and polishing of jet turbine blades. A cast mount holds a die grinder in

(Advertisement)

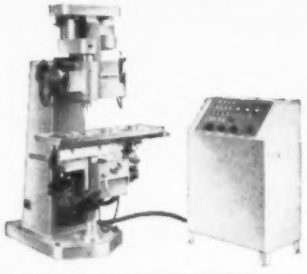
A P&W Tracer-Controlled MILLER FOR EVERY JOB



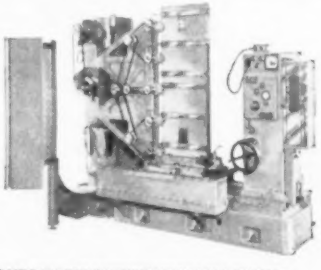
KELLER TYPE BG-21 . . . a powerful, versatile machine in a range of sizes from 5′ x 2½′ to 10′ x 4′, in single and 2-spindle models.



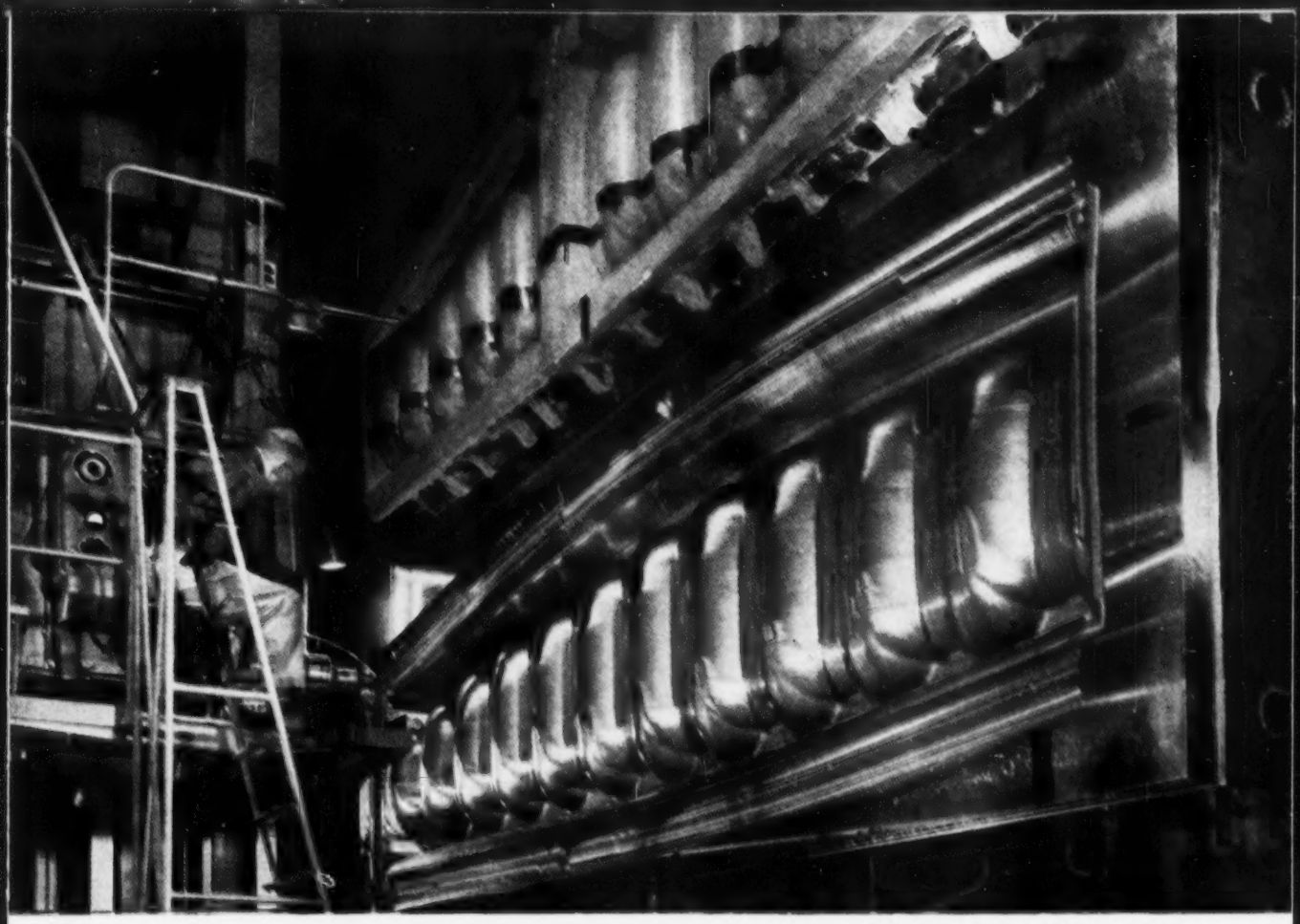
KELLER TYPE BL . . . a compact, powerful Tracer-Controlled Miller for work within the range of 36″ x 20″. With all new Keller features. Single and 3-spindle models.



VELVETRACE® MILLING MACHINE . . . duplicates the finest detail with extreme precision. New, non-contacting tracer control cannot damage the softest, most fragile 3-dimensional models.



AUTOMATIC DUPLICATION MACHINES . . . automatically reproduces original forging dies and glass or plastic molds with remarkable precision and detail. Two versions, one for molds, one for dies, with 1, 2 or 4 spindles.



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To machine the WORLD'S LARGEST DIE,

ALCOA chose the Keller . . .

. . . AUTOMATIC TRACER-CONTROLLED MILLING MACHINE

Consisting of two halves, each weighing 30 tons, this is the world's largest closed die block. Designed to forge aluminum backbones of fuselage and wing structures for the new multi-jet Martin SeaMaster, this giant die was produced on a P&W Keller BG-22 at the U.S. Air Force Heavy Press Plant operated by Aluminum Company of America.

Chances are that your own workpieces aren't as large as this die, but there is a Pratt & Whitney Keller Automatic Tracer-Controlled Miller for *every* worksize requirement. *Every* Keller Machine offers the same important advantages: fast, accurate reproduction of complex 3-dimensional shapes, extreme versatility and an overall ability to produce highest work quality economically. These advantages will also make Keller *your* first choice for a wide variety of die, mold and other hard-to-handle 2- and 3-dimensional milling jobs. Write now for complete information.

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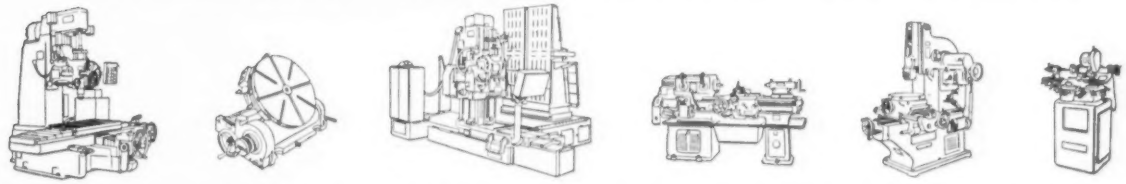

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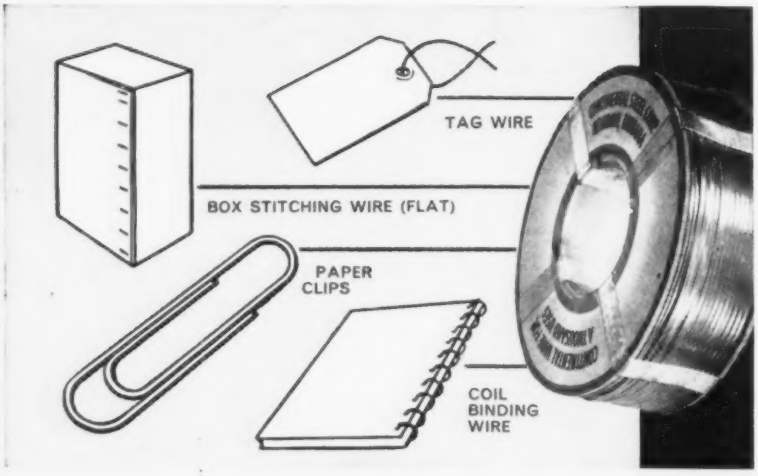

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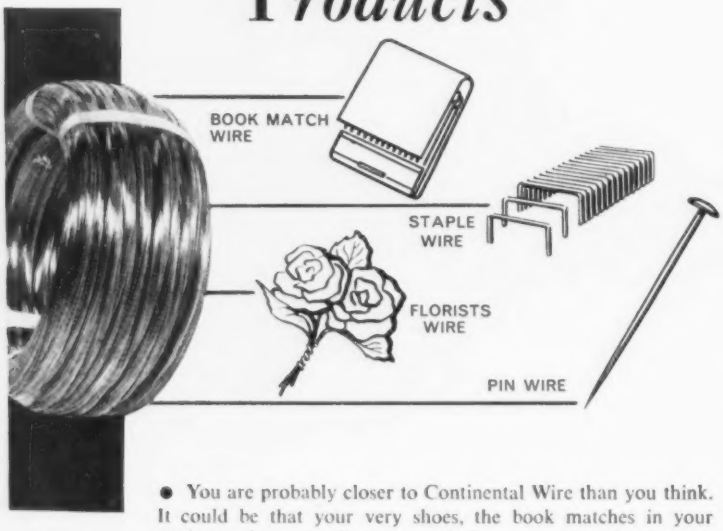

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stable position to give additional control and comfort to the operator.

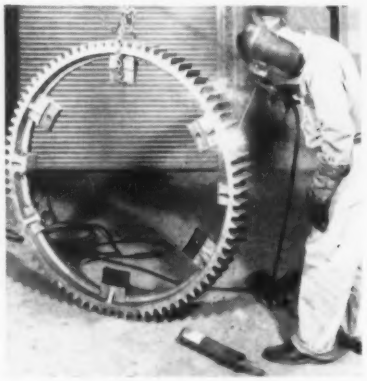
Used at Misco Precision Casting Co., Muskegon Heights, Mich., the company makes use of some 50 such setups. Magnifying lenses, special exhaust mufflers and exhaust blowers, together with air line lubricators, complete the installation.

Die grinders operate at speeds to 25,000 rpm. These grind, de-burr, and finish-polish the hollow alloy turbine blades.

Hard-faced Spur Gears Last, Last and Last

An improvement of over 3400 pct in gear life through hard-facing is reported by a midwestern manufacturer. The gear in question is used in a ball mill operation. Hard-facing material responsible is Colmonoy No. 2, an iron-base electrode containing chromium, molybdenum, silicon and carbon.

The ball mill processes metallic compounds that contain extremely abrasive ingredients. During the

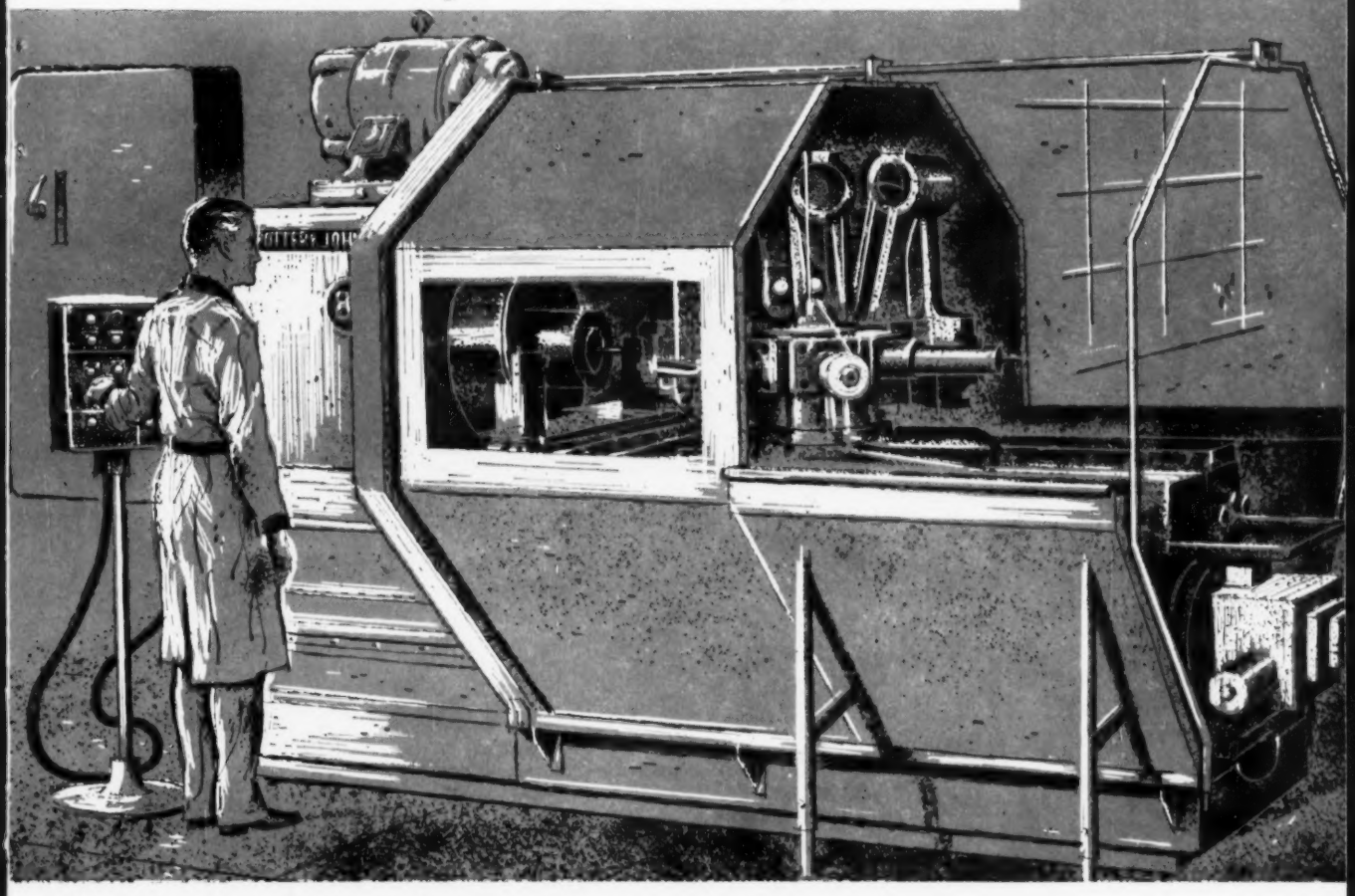


Here, a worker hard-faces the wear face of each gear tooth.

process, metallic dust emanates from the rotating ball mill and settles on the driving gears. This decidedly complicates the problem of gear wear.

Resists Wear—The pinion gear is fabricated of hardened steel; being small in size it resists fairly

*Here it is . . . . the machine industry's been asking for !**



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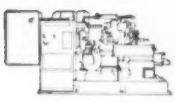
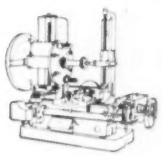
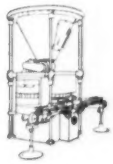
Potter & Johnston Company, Pawtucket, Rhode Island.



AUTOMATIC TURRET LATHES



GEAR CUTTERS



GILDA PACKAGING MACHINES

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PRECISION PRODUCTION TOOLING SINCE 1898

well the abrasion of the metallic dust deposits. Original equipment spur gears, however, are too large to economically permit making them of the same material.

To hold cost down while providing wear resistant qualities for normal service, the ball mill manufacturer produces the spur gears of high-grade cast iron. The new gears have cast, unmachined tooth surfaces.

Guesses Wrong — When first installed, the spur gear operated but 80 hours before being worn to uselessness. The user at first assumed that the gear was either the product of an unsound casting or out of tolerance in some way. Another gear was ordered and installed with approximately the same result.

In all, a total of four original equipment replacement spur gears were tried with similar results in every case. No gear lasted longer than 140 hours in this service.

Solves Problem—At this point, the user decided to try hard-facing the spur gear on the wearing face of each tooth. The result is a gear that, after 1760 hours of operation under identical conditions, shows no visible signs of wear. Based on performance to date, total gear life may exceed 5000 hours.

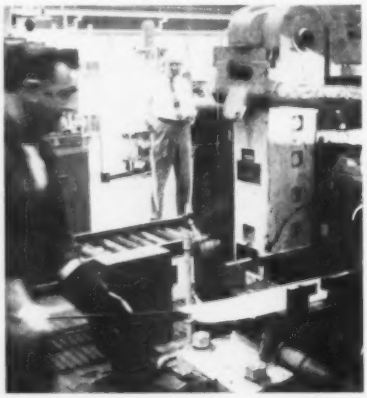
The hard-faced gear, therefore, will outlast more than 35 unprotected parts. Another remarkable fact is that reclamation of a worn gear by hard-facing is less costly than purchase of a new gear.

Checks Rolling Close

Proper timing of processing steps is essential in preparing a new magnetic sheet material. So finds General Electric Co., Schenectady, N. Y.

The new material, known as "four square" silicon iron, is designed to increase the efficiency of transformers, motors and generators made by the firm. To assure precision and accuracy in producing it, scientists at the company's research laboratory use stopwatches as quality control tools.

While a technician processes the silicon iron through rolling mill operations, a development man times him to the instant. All steps, which reduce the material to thickness required for use in the laminated cores of large transformers, are carefully timed and checked.



Checker with stopwatch times a rolling-mill operation.

Develop New Engine

Now in production is a new industrial type air-cooled gasoline engine. Developed by the U. S. Army Corps of Engineers, the small-size engine ranges in size from ½ to 20 hp. And parts are highly interchangeable. The standardized engine replaces 78 different types and sizes of such units previously used.

Continental Motors Co., Detroit, is manufacturing them for the Armed Forces.

Electricity From Gas

Direct conversion of the chemical energy of gases into electricity is now more than a laboratory curiosity. It's a fact. Developers at National Carbon Co., Parma, Ohio, have produced such a fuel cell capable of turning out thousands of watts of power.

Secret of the new fuel cell, say

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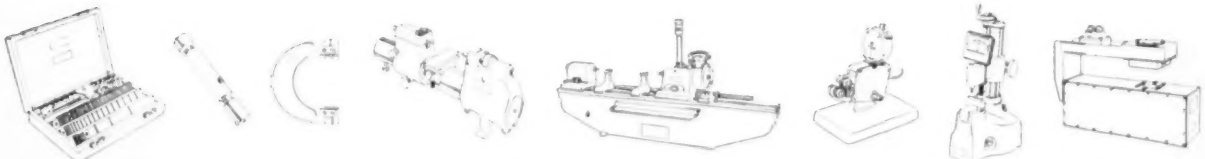

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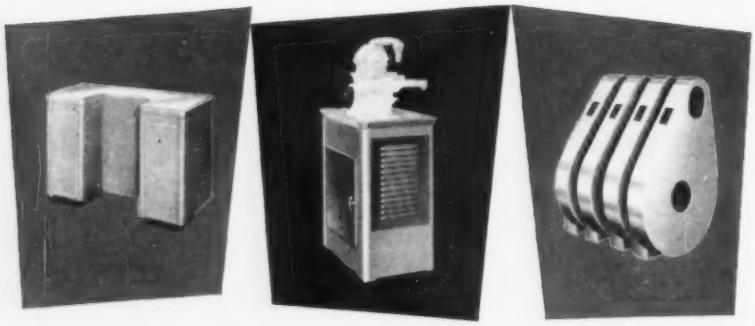
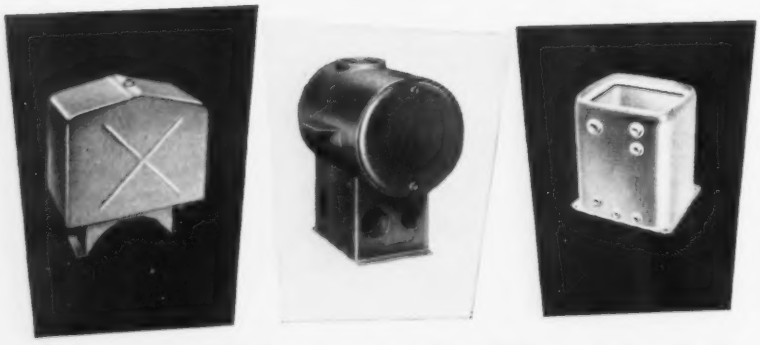


COMPONENT



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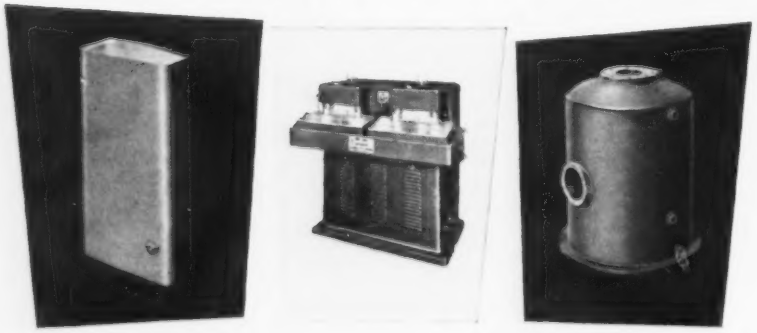

its perfectors, is its chemically treated, hollow, porous carbon electrodes. Through these the gases enter the cell. They also conduct the electricity produced by the electrochemical action. The unit uses hydrogen and oxygen as fuel.

Hard To Reach Valves Are Easy To Reach

That bane of the maintenance man, the hard-to-get-at valve, is passing from the industrial scene in increasing numbers. The reason, according to Rockwell Mfg. Co., Pittsburgh, is lubricated plug valve design and a growing list of accessories.

Today almost any valve, whether overhead or underground, can be operated easily by a single workman. Some typical "hard-to-reach" valve solutions, based on quarter-turn action of the lubricated plug valve, include: (1) An overhead 3-in. lubricated plug valve is operated by a quarter-turn of the wrench extension, (2) Small 1-in. lubricated plugs used as gas cocks

A quarter turn of a lubricated plug valve does the job.

on front-fired boilers are adapted to chain operation, (3) A small wrench is all that's necessary to operate a valve in a product distribution system from full open to full closed in a quarter turn. Compact

design of lubricated plug valves allows tight manifolding of other lines at convenient eye level, (4) An underground valve is equipped for operation from ground level by high stem extension. In service on a gas pipeline, this gear-operated lubricated plug valve was installed in its water-tight housing 28 years ago.

Coating Protects Parts From Liquid Aluminum

Coating steel and cast iron parts with a chromium boride material protects them against attack by liquid aluminum. So reports Metallizing Corp. of America, Chicago.

The process employs chromium boride rods. These are flame-sprayed on the parts with new type metal-spraying equipment.

Stops Wetting—Such a coating, reports the company, completely prevents wetting of the coated steel or iron by molten aluminum. The coating has excellent oxidation resistance to 1800°F.

Some uses for the process might include: thermocouple tubes, construction parts to be inserted in molten aluminum, heat exchangers, aluminum casting equipment, etc.

Chemical Milling Speeds Output

Chemical milling helps an aircraft maker speed its working of wingtip skins. The skins do not lose structural strength, either.

Employed by Beech Aircraft Corp., Wichita, Kan., the chemical milling process removes 40 lb of aluminum from the skins. It does this in different steps due to different depths in the skin needing etching.

Like Etching—Chemical milling, for such aircraft production applications, was recently developed by North American Aviation, Inc. and Turco Products, Inc. Essentially, the process consists of removing aluminum metal by chemical action. The amount of metal removed is controlled by time of immersion

Foundry Saves 12½ Hours With Arcair

Vancouver Iron Works, in British Columbia, uses the Arcair Process for removing excess metal from reaction-type turbine castings—"used to take 14 hours to remove the 2¾" thick, 6" high, 16" long metal. Arcair does it in 1½ hours and no cleanup is needed." Savings on overall preparation cost — 65%. This is typical of many jobs throughout industry where the Arcair process saves both time and costs. The process consists of a torch, a special type of electrode, ordinary shop air and an ordinary D.C. welding machine.

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When you are buying new heat treat equipment, it is only good practice to buy with an eye to the future. By looking into such problems as atmospheres, automation, safety, mechanics, hydraulics and so on . . . today . . . you materially reduce tomorrow's obsolescence factor. Sometimes, existing furnaces can be redesigned with modern techniques and, as a result, can be geared to present production demands.

In any case, it is a good idea to talk over your problem with a Holcroft engineer. He has the technical know-how, the training and practical experience, to help you reduce early obsolescence in your plant. You'll find that Holcroft furnaces are built to answer today's problems—*and tomorrow's too*. Write for information.

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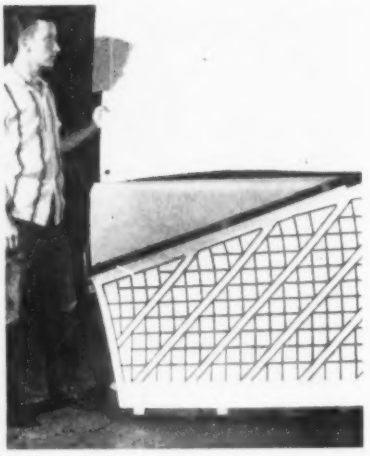
CANADA: Walker Metal Products, Ltd., Windsor, Ontario

in the milling solution. Areas that require no metal removal may be masked by several different methods to protect the metal from the chemical solution.

Engineering design advantages of chemical etching are several. First, it can be performed after forming operations. Secondly, it is not limited by machining restrictions as to



Nearly 40 lb of aluminum were removed from this "skin."

shape, direction of cut, or limiting radius of cutters. Moreover, it can be performed on both sides at once. Tolerance can be held to 0.005 in. And it can be adapted to produce tapering of parts.

Still More Reasons—Operational and economic advantages of this process add up too. It does not require highly skilled operators. And it offers quantity production since the number of parts that can be milled simultaneously is limited only by the size of the tank. What's more, chemical milled parts require no surface operations such as sanding or polishing.

Another important advantage is that equipment is relatively less expensive than heavy machinery used in other processes. Chemical milling is only supplementary to machine milling since many parts are impractical for this method of etching.

In removing the 40 lb of alu-

minum from skins, Beech Aircraft etches them in a strong caustic solution heated to 190°F. This removes 0.001 in. of metal for each minute the part is exposed to the solution. Correct concentration and temperature, necessary for accurate milling, require close control.

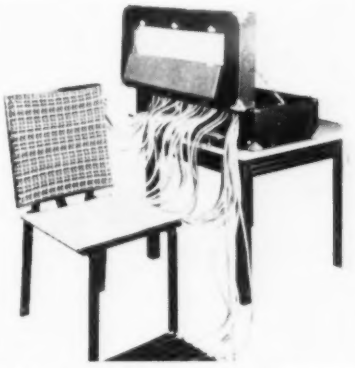
Metering Device Checks Seats

Just about everyone relies on some type meter for values or accuracy. So why not a gage to measure adjustment of chairs and stools used by employees?

Many plants employ workers that remain seated at their jobs. These include assemblers of small components, management and other personnel.

To get efficiency, output and worker comfort, correct seating is important. Hence, an instrument maker has introduced this device for checking seating. It instantly calibrates every inch of the human form contacted in a seating position.

The instrument checks height and depth of seat, relation of arm and elbow to working plane, tension for



This unit checks a sitter's posture, seating habits, etc.

back-support, feet support, etc.

Standard Foundry Products of Reading, Pa., makes the seating measurement device.

Vibration Checker

Compact and self-contained, this instrument makes permanent records of machinery vibration on a continuous paper chart. It measures amplitude and frequency. A

Measuring machine vibrations is this instrument's job.

key feature is an instantaneous external adjustment which selects the degree of magnification desired, giving 40, 20, 10 or 5:1 ratios. No battery or outside power source is required. A carbon shod ball bearing probe is provided for taking measurements directly on the surface of rotating shafts.

The Vibroscope Co., Glenford, N. Y., manufactures the instrument.

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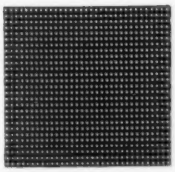

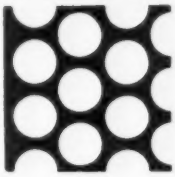

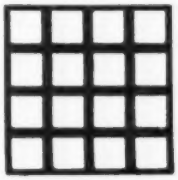

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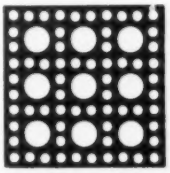

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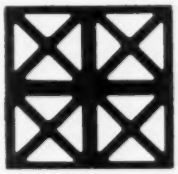

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Equipment, Methods and Services

Refrigerator Chills at –320° Without Power

Without using a power supply, a new portable liquid nitrogen refrigerator chills at —320°F. Here's how it works: a double-walled (container within a container) jacket of welded stainless steel is insulated by a vacuum-powder combination. The inner container is filled with liquid nitrogen having the —320°F temperature. Accessory storage baskets filled with material for freezing or cold storage are lowered into the liquid nitrogen. The unit holds material at —320°F constantly as long as liquid nitrogen, in any quantity, is present. A single charge of liquid nitrogen holds up to 34 days. Since the unit weighs only 115 lb fully charged (60 lb empty), it can be transported easily. Its freedom of dependence on a power source means complete mobility. It also means security against power failures. Some uses for the unit include: shrink-fitting small metal parts; cold-storing aluminum rivets; freezing metallurgical samples. (Linde Co. Div., Union Carbide Corp.)

For more data circle No. 41 on postcard, p. 137

Deburring Unit Surface Finishes 8½-ft Parts

This unit represents a new idea in deburring machines. It is part of a system that finishes parts to 8½-ft long. The rugged setup uses a combination of mechanical and hydraulic power drive. Solenoids and electronic controls keep the powered unit perfectly timed and coordinated. The unit comes in sections. Each section surface finishes from one to a cluster of four or as many as six parts, depending on a configuration. Not intended to replace barrel finishing machines, the unit supplements or goes beyond the scope of barrel finishing, its maker says. The equipment is designed on a building-block principle; units can be stretched out to take lengths to 100 ft or more, if necessary. In theory, lengths could run into infinity. (Speed-D-Burr Corp.)

For more data circle No. 42 on postcard, p. 137

Impact Wrench Offers Rugged Power, Fast Work

Featuring a torque range of 300 to 450 ft-lb, this new impact wrench augments the maker's smaller models. The high capacity tool is recommended for heavy-duty construction, maintenance and repair work. Built for rugged wear, the wrench has a diecast aluminum housing, lubricant-sealed ball bearings, and heat-treated gears. Powered by a special motor for both ac and dc operation (available for either 115 or 220 v), the tool is ideal for large, heavy nuts running from ⅞-in. up. It's also good for cap and lag screw driving and removal. A specially designed centrifugal fan and ventilating system give this tool the coolest possible operating temperature at all times. In addition to rugged power, the wrench also features ease of operation, fast working. (Black & Decker Mfg. Co.)

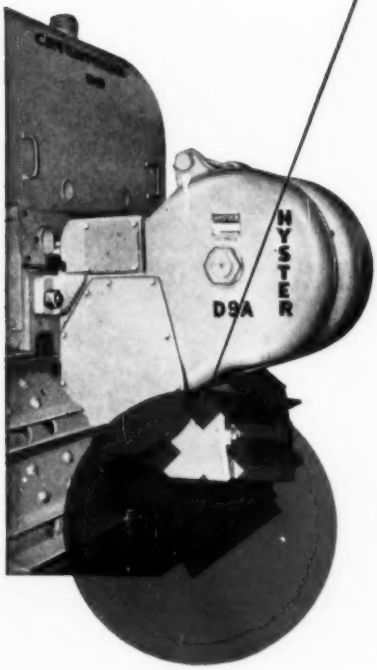
For more data circle No. 43 on postcard, p. 137

Hyster "98" Logging Arch and D9A Towing Winch especially designed for operation with Caterpillar D9 tractors.

by switching to

OSTUCO TUBING

here and here...



Hyster Company Makes Double-Cut on Costs!

Hyster Company, Portland, Oregon, out to beat machining costs of components in their logging arches and winches and a drawbar bracket, turned the trick by switching from another material to OSTUCO Seamless Steel Tubing.

Drawbar Bracket—Use of OSTUCO Tubing cut material and machining costs from $120,500 to $81,820 annually for a reduction of 32%.

Logging Arch—Used as sleeves in the Hyster "98" Arch, OSTUCO Tubing reduced material and manpower costs 10% annually.

In addition, Hyster engineers report the equipment is stronger and better able to take the strain of heavy hauling and winching jobs over rough logging terrain.

Perhaps you have hidden profit-robbers in your product. Better contact OHIO SEAMLESS for recommendations . . . without obligation on your part, of course.

OSTUCO TUBING
MANUFACTURED IN
SHELBY, OHIO
EXCLUSIVELY BY
OHIO SEAMLESS TUBE DIVISION
OF COPPERWELD STEEL COMPANY

SHELBY, OHIO • Birthplace of the Seamless Steel Tube Industry in America
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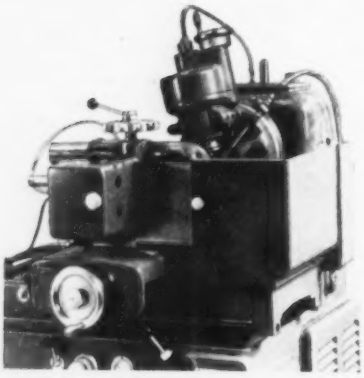


Mills Pieces Requiring Dividing Operation

Suited especially for milling workpieces that require dividing operations is this milling machine. Universally adjustable, the unit employs an automatic indexing attachment; this means milling of a wide variety of pieces is possible. It mills teeth on end or circumferential surfaces—or straight or helical flutes on cylindrical or tapered tools. Typical workpieces include milling cutters of all kinds, cylindrical and tapered reamers, countersinks, ratchet wheels, and index plates. Swiss-made, the miller is designed so one operator can run several of them. Maximum longitudinal slide travel is 15 in. with variable stepless feed from ¾ to 8 ipm. The workpiece support can be swivelled horizontally to 90°. (Cosa Corp.)

For more data circle No. 44 on postcard, p. 137

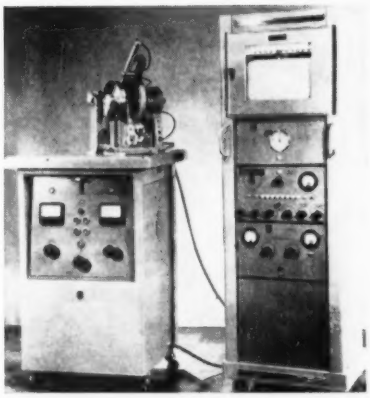
Portable Grinder Smooths Flat, Curved Surfaces

Cup wheel grinding, sanding or wire wheel work can be performed with this vertical pneumatic grinder. With a 6-in. cup wheel, wire brush or flexible sanding disk, it takes down rough spots on flat or curved surfaces with equal efficiency. Equipped with two handles, it is easy for an operator to maneuver the grinder and keep it under control in any position at any speed. The 700-v tool weighs just 11 lb. It is balanced to grind evenly and smoothly with little added pressure at speeds from 4500 to 6000 rpm. An easy to adjust thumb button control makes it simple to adjust the grinding speed quickly. (Airetool Mfg. Co.)

For more data circle No. 45 on postcard, p. 137

LOOK...NO HANDS!

Diffractometer Incorporates Many Improvements



Built especially for powder diffraction work, this unit features many new improvements over earlier models. The redesigned x-ray diffractometer is built especially for powder diffraction work. It accommodates: high and low temperature chambers, devices for preferred orientation and pole figure studies, focussing monochromators, etc. The instrument saves time for its user through the use of high intensities, automatic recording features, low service problems and easy alignment. Three components comprise the assembly: (1) a basic x-ray generator and tube, (2) a wide-range goniometer with a detector, and (3) an electronic circuit panel with a strip chart recorder. The goniometer accommodates scintillation, proportional, or geiger counter units. (Phillips Electronics, Inc.)

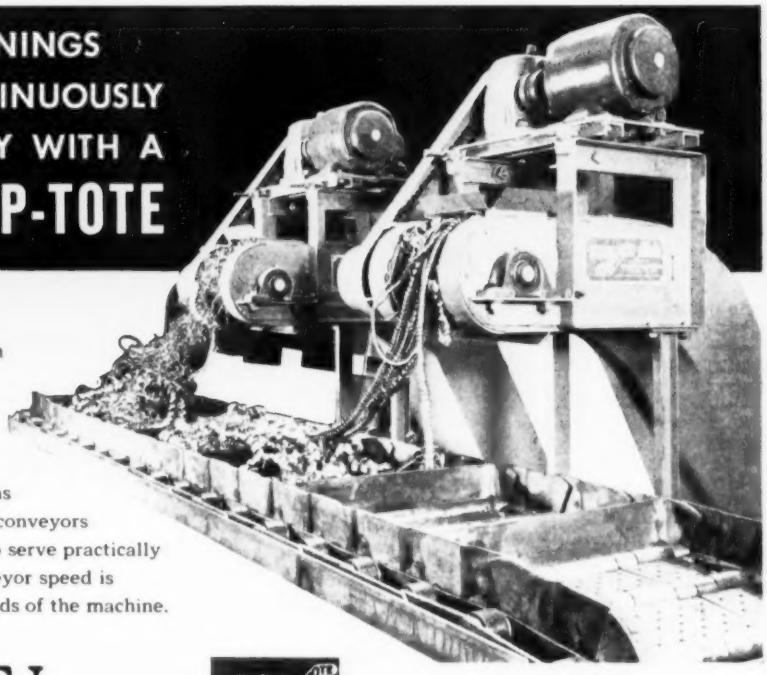
For more data circle No. 46 on postcard, p. 137

Production Machine Hobs Gears at High Speed

For both small and large shop use, this gear hobber works at high speeds. The horizontal, single-spindle unit is versatile enough for small shops; yet it also fits in easily with automated gear lines in big plants. The hobber has an 8-in. center distance between the hob arbor and work spindle. Its entire hobbing cycle is automatic; the machine returns to the loading position upon completion of the part. Loading and cutting time for most gears is measured in seconds. Either conventional or climb hobbing can be used with single or multiple thread hobs. Gear washers and gear classifiers can be easily integrated with the machine. Automatic size control can also be provided. All controls are safety interlocked and all circuits comply to JIC standards. (Michigan Tool Co.)

For more data circle No. 47 on postcard, p. 137

REMOVE CHIPS, TURNINGS
AND BORINGS CONTINUOUSLY
AND AUTOMATICALLY WITH A
MAY-FRAN CHIP-TOTE



That's right! The May-Fran CHIP-TOTE permits the continuous operation of machine tools by eliminating down-time for scrap removal . . . skilled workers stay on the job . . . production increases by as much as 20%! Versatile CHIP-TOTE conveyors are available in a wide range of sizes to serve practically any type or size of machine tool. Conveyor speed is adjusted to meet the scrap removal needs of the machine.

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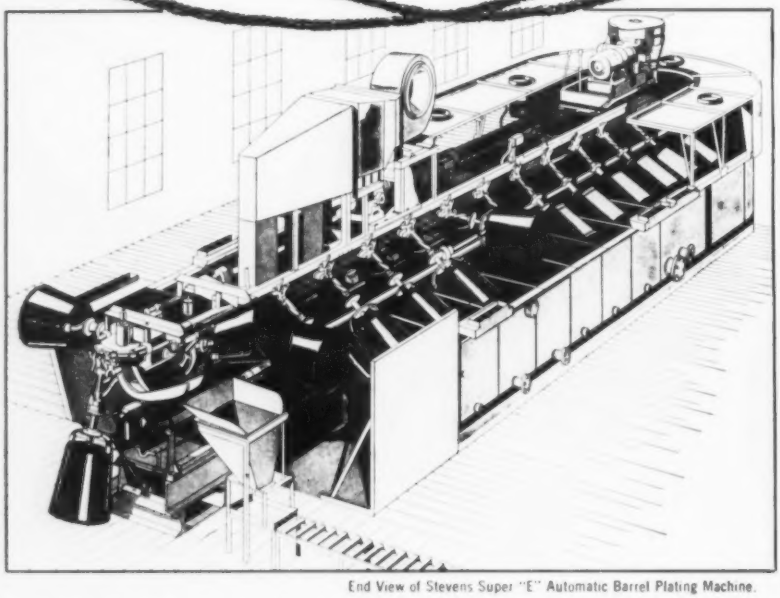
Write today for your copy of Bulletin MF-640.

7721 MF

Barrel Plating by Stevens Really Cuts Costs



End View of Stevens Super "E" Automatic Barrel Plating Machine.

Since Stevens first introduced the Automatic Barrel machine scores of industries have enjoyed these operational advantages. Check them against your present operations.

MINIMUM LABOR REQUIRED — In most cases, one unskilled employee can operate the machine.

HANDLES THE COMPLETE CYCLE — Including cleaning, pickling, chromate treatments, plating, bright dip and drying.

COMPLETELY AUTOMATIC — No barrel lids to fasten and unfasten during automatic loading and unloading.

BETTER HANDLING — No mixing of parts. Becomes a part of a straight line production system.

NO HEALTH HAZARD — Occupational health hazards eliminated with ventilation of equipment.

UNIFORMITY OF PLATE — Accurate plating cycles timed to meet your requirements.

FITS ANY PLANT LOCATION — Does not need special buildings—Can be moved at any time. Low head room.

DEPENDABLE — Scores of machines in use. Machine design and construction constantly improved.

LOW INITIAL COSTS — For average operation lowest initial machine costs.

LOW MAINTENANCE COSTS — Proven over years of use and in varied operations.

FREDERIC B. STEVENS INCORPORATED
YOUR METAL FINISHING SUPERMARKET
DETROIT 16, MICHIGAN

Let a Stevens Sales Engineer show you how you can cut costs in your plating operation with a Stevens Automatic Barrel. Write us direct. Frederic B. Stevens, Inc., 1816-18th Street, Detroit 16, Michigan.

METAL FINISHING EQUIPMENT AND SUPPLIES, FROM CASTINGS OR STAMPINGS TO FINISHED PRODUCT

BRANCHES:
Buffalo • Indianapolis • New Haven
Offices in Principal Cities

NEW EQUIPMENT

Inspection Bench

Now it's not necessary to remove gages from the job and take them to a laboratory for inspection. The work can be done right on the job with a portable inspection bench. Necessary gage blocks and accessories for checking the various type gages in use can be carried, also spare gages to replace worn units. In addition to contributing to quality control, this convenient mobile system saves man hours, increases production and reduces rejects. It can also serve to reduce the inventory of expensive gages and eliminate the possibility of returning the wrong gage to the machine operator. The unit can easily be moved to the desired location by means of the easy-rolling casters. A heavy-duty foot brake locks it to the floor. (Wright Tool Co.)

For more data circle No. 48 on postcard, p. 137

Loaders, Unloaders

New model loaders and unloaders handle work in and out of one firm's automatic heat treating units. The loader incorporates a roller platform with a table type mechanism. A primary pusher bar, activated by parallel chains, moves the work tray forward off the roller platform. The machanism then reveals a secondary pusher bar to fully advance the work tray into its desired position. The chain driven mechanism then retracts, ready for the next cycle. Basically similar in

design, unloaders reverse the loading action. They extend grab-bars through the open discharge door, automatically grasp the work tray, bring it out of the chamber into position upon the roller platform. Both loaders and unloaders require little more floor area than the physical size of the work trays they handle. (Ipsen Industries, Inc.)

For more data circle No. 49 on postcard, p. 137

Turret Lathe

High-speed production of heavy components is the job of a new automatic turret lathe. With a 40-in. diam swing over the bed ways, chuck sizes to 30-in. and a 50-hp motor, the lathe is intermediate in size between its maker's other models. It has a wide range of speeds and feeds with four automatic speed changes for each set of pick-off gears. (Potter & Johnson Co.)

For more data circle No. 50 on postcard, p. 137

Cable Clamp

Want to attach a load to a continuous cable in a hurry? Well, a new continuous cable clamp may fill the bill. The three-part fitting consists of a wedge clamp, wedge, and cable clip. Clamps come for rope sizes from ⅜ to 1¼ in. (Sauerman Bros., Inc.)

For more data circle No. 51 on postcard, p. 137

Contour Cutters

Standard, carbide-tipped port contour cutters for profiling are now available. Both tools form a complete contour as the tool is fed into a drilled hole. Carbide flutes provide long cutter life, smooth finish and a large number of cuts per grind. The cutters come in 13

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PERKINS can custom-cut a precision gear to fit your exact needs...make you a gear that guarantees full capacity and trouble-free performance. Many gear-makers promise a precision gear — Perkins delivers precision . . . always. Fifty-two years of gear-making for aircraft, automotive and instrument manufacturers assure top quality. Extensive facilities, modern equipment, rigid production and quality controls produce gears consistently uniform in tolerance with a burr-free micro finish. Perkins quality eliminates production delays and costly rejects for you . . . Perkins gears wear longer, cost you less in the long run. Ask us to quote on your next gear requirement. Then judge for yourself.

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Dept. 31, West Springfield, Mass.
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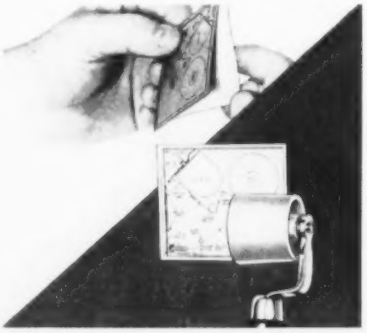
diameters for all sizes of fittings used with ⅛ through 2-in. diam tubing. (Sonnet Tool & Mfg. Co.)
For more data circle No. 52 on postcard, p. 137

Marker, Stamper

Automatically performing two marking operations on aircraft engine valve tappet guides is a new machine. It roll-marks workpieces with a two line identification on the smaller OD surface; it also stamps a timing mark on the upper flat surface. The machine features a motor driven continuously rotating work dial with eight studs, or mandrels, over which the work pieces are placed. The mandrels support the work pieces during marking and permit free rotation as the work piece travels across the face of the marking die. The work dial is also equipped with heat treated wear plates to take the stamping shock. (Noble & Westbrook Mfg. Co.)
For more data circle No. 53 on postcard, p. 137

Metal Nameplate

Only ten seconds are required to apply a new type of deep-anodized, self-bonding metal nameplate. The plate employs a permanent pressure sensitive adhesive that requires no activation by water, solvent or heat.



You simply remove a release liner and apply. Made from 0.004 in. aluminum, the plate is backed with adhesive that sticks instantly to metal, glass, plastic, wood, painted, smooth, flat, wrinkled and curved surfaces. It comes in a wide range of colors—both glossy and matte finish. (W. H. Brady Co.)
For more data circle No. 54 on postcard, p. 137

Band Saw

A new band saw features a broad range of blade speeds and feeds to get long life from high-speed steel blades. This precision tool is a heavy-duty machine of the horizontal type. (Henry G. Thompson & Son Co.)
For more data circle No. 55 on postcard, p. 137

Bar Turner

A new centerless bar turning machine both rough and precision turns ferrous and non-ferrous bars. It works bars of titanium, uranium and other modern metals, too. Ovality tolerances of ±0.00025 in., and a maximum limit of diameter variation of ±0.001 in., in any 20 ft length of bar, are achieved for precision turned bars with a finish comparable to centerless

Reliable SPENCER Blowers

On original equipment . . . or for replacement . . . men who *know metals* specify SPENCER Blowers.

This Drever heat treating line — largest of its type in the world (capacity: 21½ tons of plate per hour)—utilizes a total of 26 Spencer Blowers. The hardening furnace (charging end shown above) is equipped with 11 Spencer Blowers ranging from 200 to 4,100 C.F.M.; the tempering furnace has 15 Spencer blowers delivering from 450 to 1,900 C.F.M.

Rugged reliability . . . simple construction . . . assured uniform pressure at varying volumes . . . mounting that requires no special foundation — these are a few of the reasons why SPENCER IS PREFERRED.

Request Bulletin 126-A containing complete specifications.

The SPENCER TURBINE COMPANY
HARTFORD 6, CONNECTICUT

OTHER QUALITY SPENCER PRODUCTS

grinding. The bar turners operate either semi or fully automatic. They feature a wide variation of feeds for rough or precision turning. Simply by changing cutter heads, users can switch from rough to precision jobs without delay. Main drive is by a variable-speed motor. Shafts and gears are roller bearing equipped and gears are set in a continuous oil bath. (Sutton Engineering Co.)

For more data circle No. 56 on postcard, p. 137

Portable Pump

This portable packaged pumping system transfers coolants from one place to another. Using a ¾-in. bronze pump, the unit utilizes phenolic or neoprene impellers, carbon bearings and split Teflon-

asbestos packing rings. Driven by a ⅓-hp heavy duty motor, the pump has a capacity to 10 gpm and pressures to 75 psi. Weighing 55 lb complete and measuring only 24 in. long by 17 in. deep, the pumping unit is built for movement in narrow quarters. (Eco Engineering Co.)

For more data circle No. 57 on postcard, p. 137

Toolroom Lathe

Giving 32 speeds, a new all-geared head lathe handles toolroom and production turning. Two sizes are available offering 21-in. swing over bedways and 25 in. swing over bedways. Speeds run from 13 to 2000 rpm. (Hendey Machine Div., Barber-Colman Co.)

For more data circle No. 58 on postcard, p. 137

Vertical Miller

Made in Sweden, a new vertical milling machine meets precision requirements for the manufacture of jigs, fixtures and gages. The machine provides ruggedness and vibrationless operation with no sacrifice of accuracy in precision boring, milling or hole grinding operations. Its spindle is of nitrided steel; it has a standard No. 30 milling machine taper and runs in precision roller and ball bearings. Either manual or automatic feed is provided for the longitudinal and vertical movements. (Homestead, Inc.)

For more data circle No. 59 on postcard, p. 137

High-speed Shear

Designed primarily for automated lines cutting metal sheet to specified length from coil stock, this shear is friction clutch operated. This permits operation at a rate approxi-

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Specify AND INSTALL

HAWS EMERGENCY EYE-WASH FOUNTAINS

MODEL 8930: basic eye-wash fountain, one of numerous models.

Many workers use Haws Eye-Wash fountains daily — as a convenient way to thoroughly cleanse and soothe the eyes after exposure to dust, dirt or glaring heat.

Immediate first-aid for eye-accidents! **FOR SHOPS, FOUNDRIES, LABORATORIES, FACTORIES** — wherever eyes are exposed to danger. HAWS Emergency Eye-Wash Fountains have special fountain heads that send controlled streams of water into the eye, flushing away chemicals or other foreign particles -- saving vital moments until medical aid arrives, possibly avoiding permanent injury. A complete safety installation includes the HAWS Eye-Wash Fountain combined with HAWS Drench Shower unit for contaminated bodies. **Protect your workers!**

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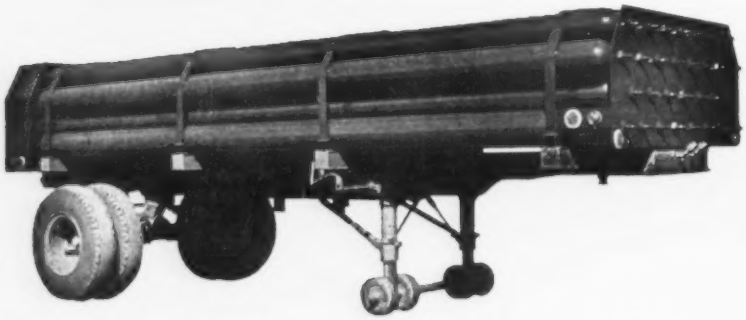

Sizes and weights to meet all State requirements.

Can be mounted on bases for permanent storage.

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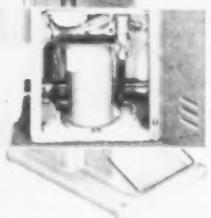
BETTER IN DESIGN IN OPERATION

RUTHMAN

GUSHER

Coolant Pumps



Simple in design with fewer moving parts to wear, Gusher Coolant Pumps will give you year after year of very efficient service at very low maintenance cost. The pre-lubricated heavy-duty ball bearings require minimum attention. The electronically balanced rotating assembly eliminates vibration. Always specify Gusher Coolant Pumps for a trouble-free coolant system.

Type 1 P-3 Short

Illustrated is a Snow Manufacturing Co. Single Spindle Vertical Full Universal Tapping Machine equipped with a Gusher Pump.

THERE'S A GUSHER FOR EVERY REQUIREMENT

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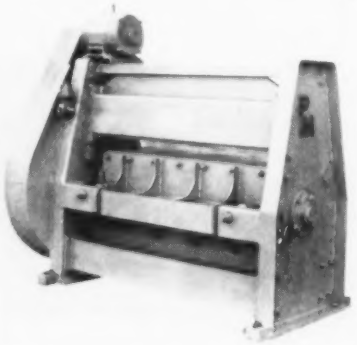
- COOLANT PUMPS
- CIRCULATORS • AGITATORS
- MOLTEN METAL PUMPS

1809-1823 Reading Road

Cincinnati 2, Ohio

mately double the rate of some square cut shears. The friction clutch allows accurate control, too. Used on a cutting line, the shear design is such that the loop or hump in the stock can be reduced, and the gauge on a PM gauge table can be advanced closer to the shear,

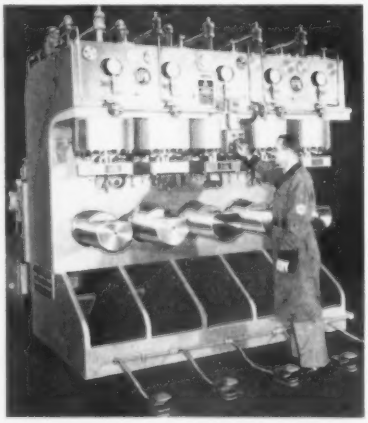


allowing a shorter minimum cut. When the sheet is cut, the metal lies flat from gauge stop to shear blade, insuring accuracy of length, without any variation caused by lifting or depressing the end of the sheet. (Production Machinery Corp.)

For more data circle No. 60 on postcard, p. 137

Open-gap Press

This five-station open gap horn press performs punching and embossing operations formerly requiring several presses. One compact welded steel frame houses five main cylinder and ram assemblies; these are controlled individually by foot pedal at the option of the operator.



On this multiple-station press, one operator does work originally handled by several. Each of the five main rams has a pressure capacity of 100 tons. The tonnage range for each ram is adjustable from 100 tons to a minimum of 4 tons. Maximum daylight between ram adaptor and horn is 12 in.; each ram has a 6 in. stroke. Diameter at the base of each horn is 11 in. The length of the horn from the throat is 20 in. From the throat to the centerline of the ram is 15 in. The entire unit is powered by a 50-hp electric motor a 100-gal radial type piston pump. (Hydraulic Press Mfg. Co.)

For more data circle No. 61 on postcard, p. 137

Materials Handler

A rider-walkie lift truck employs an attachment to integrate itself with conveyor lines carrying bulky, fragile materials such as flasks of sand in a foundry. The unit is a high lift platform truck equipped with a swinging boom; to this a ½-ton capacity spur gear trolley type hoist is attached. The boom is of 4-inch I-beam construction. It slews through 180° permitting positioning of the hoist over a conveyor line on either side of the truck. This allows transferring of material from the line to the lift truck's platform, or from truck to line. (Yale & Towne Mfg. Co.)

For more data circle No. 62 on postcard, p. 137

No-glare Panes

A new glare-reducing, gray tinted glass is intended primarily for use in factory, warehouse and semi-industrial building windows. Its heat absorbing properties are the equivalent of ¼-in. heat-resisting plate glass with approximately 58 pct absorption of total solar energy. Transmission of visible light or glare is limited to 12.5 pct. The neutral tint almost totally eliminates "see-in" ability under normal daylight conditions. (Houze Glass Corp.)

For more data circle No. 63 on postcard, p. 137

Level Indicator

Liquid levels can now be measured with ultrasonics by a transistorized liquid level indicator. The ultrasonic pulse-ranging gage eliminates the need for floats, linkages, synchros or any moving parts. Liquid level reads directly in feet on a large meter provided with two ranges to accommodate tanks up to 15-ft high. A built-in calibration

feature assures correct level readings despite changes in velocity of sound propagation caused by varying temperatures, specific gravities, and similar differences between liquids being gaged. (Bogue Electric Mfg. Co.)

For more data circle No. 63 on postcard, p. 137

QUANTITY PRODUCTION OF GREY IRON CASTINGS

ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

ESTABLISHED 1866

THE WHELAND COMPANY

CHATTANOOGA 2, TENN.

must your product take a beating from

erosion or corrosion?

Lectro-Cladding with BART super-hard nickel may help solve your *abrasion* problems too.

Bart Lectro-Clad® process is adaptable to the functional plating of many products and parts in which resistance to erosion, corrosion, and abrasion is vital. Nickel with hardness and ductility never known before is just one of the materials that can be Lectro-Clad to a wide range of base metals. Other metals which can be plated include chrome, copper, gold and rhodium.

For assistance on *any* problem that plating might solve, Bart offers one of the most extensive research and development departments in the electroplating industry. Always available for consultation service.

Hamilton Standard Division of United Aircraft Corp. recently made this dramatic test on a twin engined plane. Aluminum prop of one engine was left unplated—the other was nickelplated by Bart Lectro-Clad process. Plane was taxied onto runway covered with loose trap rock. Volley of rock sucked into blades left unplated prop chewed and gouged. The other emerged practically unscathed.

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WIDEST SELECTION of kinds, shapes and sizes of cold finished carbon steel bars. Available anywhere—even the hard-to-get intermediate sizes.

LARGEST STOCKS—Nobody comes even close to equalling the size of our inventories which enable us to supply tons of one type and size.

HIGHEST QUALITY ASSURED—Produced to exacting quality standards, Ryerson cold finished bars are unmistakably identified by a scientific color-marking system, double checked by spark test and guarded by special racks, padded slings and protective wrapping.

FAST, DEPENDABLE SERVICE—Better than five out of every six orders for steel from Ryerson stock are shipped within 24 hours, and when emergency demands it you can count on even quicker delivery. So call your nearby Ryerson plant for every cold finished bar requirement.

RYERSON STEEL

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Machinery steel: Rycase (low carbon manganese steel), Leaded Rycase, Rytense (medium carbon manganese steel), Rytense Accuracy Stock, C1137, Ryco 44 and Stressproof (stress relieved medium carbon manganese steel)

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The Iron Age Summary

Long-Term Steel Outlook Is Good

Over the short haul, steel demand is disappointing. But the long-range picture is favorable.

Here are some factors that add up to continuing good business for the future.

■ The steel market outlook is good or disappointing, depending on how you look at it.

Some of the pessimism in steel is based largely on the short-term outlook. Automotive demand has not come up to expectations. Other steel users are playing their inventories close to the vest. (See page 75.) The mills had hoped for a stronger pickup in September. Now they're banking on October and November.

Improvement Noted—But everyone admits the market has improved over the summer low point. The steel operating rate is on the rise. And there are factors in the market that add up to continuing good business over the long haul.

Here are some of them:

Auto Picture—The late introduction of new car models guarantees a strong sheet, strip, and bar market in the last two months of this year and in the first quarter next year.

The possibility of a strike in automotive next summer. The automakers have indicated a stiffening in their attitude toward labor demands. So they are likely to maintain a fast production pace at least through first quarter '58 as a hedge against possible labor trouble.

Housing Spurt — Housing starts are pointing upward, even though the rate of increase is moderate.

Major industries such as construction, chemicals, and machine tools are looking for a slightly better volume of physical production next year, and each of these represents sizeable tonnages for steel.

Product Rundown—For the moment, the market is strongly competitive on most steel products excepting structurals, linepipe, heavy plate, and oil country goods. The mills are beating the bushes for orders in sheet and strip, stainless, bars, buttweld pipe, and wire.

Iron and steel scrap prices are reflecting the current easy situation in steel. The mills have the upper hand and are calling the turn on prices, which sagged again this week. The mills have better-than-average stocks of scrap on hand and are playing the market to their own advantage.

Mills in Control—It looks as though the mills will have the upper hand over the balance of this year. But there are signs that scrap prices may be approaching the point where it will be cheaper to use scrap than to use hot metal. Several blast furnaces were shut down last week. A greater reliance on scrap would tend to stabilize prices, or slow down decline.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	2,112	2,100	2,138	2,498
Ingot Index				
(1947-1949=100)	131.4	130.7	133.0	155.5
Operating Rates				
Chicago	81.5	82.5*	83.0	101.0
Pittsburgh	82.0	81.0*	84.0	102.0
Philadelphia	90.0	89.0*	91.0	102.0
Valley	75.0	76.0	74.0	99.0
West	100.0	100.0	100.0	99.0
Buffalo	100.0	100.0	98.0	102.0
Cleveland	85.5	87.5*	89.0	105.0
Detroit	93.0	93.0*	88.0	106.0
S. Ohio River	87.0	86.5*	87.0	86.0
South	72.5	73.0	85.0	90.0
Upper Ohio R.	96.5	99.5*	94.0	106.0
St. Louis	78.0	77.0*	77.0	97.0
Northeast	41.5	41.0	37.0	100.0
Aggregate	82.5	82.0	83.5	101.5

*Revised

Prices At a Glance

(cents per lb unless otherwise noted)	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.967	5.967	5.967	5.622
Pig Iron (Gross ton)	$66.42	$66.42	$66.42	$63.04
Scrap, No. 1 hvy (Gross ton)	$43.83	$46.67	$51.50	$58.17
Nonferrous				
Aluminum ingot	28.10	28.10	28.10	27.10
Copper, electrolytic	27.00	27.00	28.50	40.00
Lead, St. Louis	13.80	13.80	13.80	15.80
Magnesium ingot	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	64.50
Tin Straits, N. Y.	93.50	93.625*	93.50	104.87
Zinc, E. St. Louis	10.00	10.00	10.00	13.50

*Revised

PURCHASING

Valve Buyers Face Price Hikes

Producers of standard industrial valves make no bones about it: Prices are going up.

But delivery is fast. So if your valve inventory is low you should buy now.

▪ For the buyer of valves, the only uncertainty in the market is price. Deliveries on standard items vary from off-the-shelf to a maximum wait of about four weeks.

Valve makers are faced with the same rising cost problems as are most industries today. Many are figuring on raising prices sometime during the fourth quarter. For some, it will be the second price hike within a year.

Better Products—With the market returning to a more normal balance between supply and demand, valve makers are giving product development a lot more attention. One eastern producer, which suffered heavy cutbacks in government orders, rolled up its sleeves and went to work developing better industrial valves.

It came up with a line of check valves for high pressures and hydraulics that eliminates damage to pipes caused by water surge and back pressure.

O-Ring Protection—Another important design change involved use of O-ring seals for relief valves that have a positive shut-off feature at specified pressures. The manufacturer has high hopes for this item, especially in swing joint valves for machine tools.

It replaces the tapered metal-to-metal plugs found in most soup lines. The O-ring offers leak-proof protection up to 5000 psi. In tests, the valve stood up under the equivalent of seven years continuous use.

In the past two years, the same company saw its industrial valve business increase up to 300 pct, largely because of product improvements.

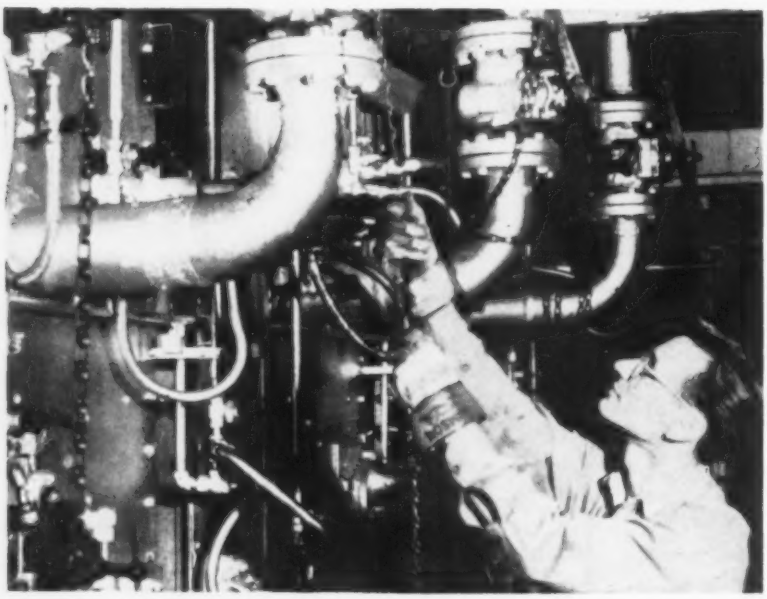
Plastic Competition — Another new wrinkle to valve design is the use of plastics. A New Jersey producer offers immediate delivery on 1-in. and 2-in plastic gate valves with screwed ends. Sizes from ½ in. to 4 in. will be available shortly.

Advantages claimed for the plastic valves are resistance to chemical corrosion, temperature resistance up to 170°F, quick, easy maintenance. The plastic design combines the best features of gate and globe valves, the maker claims.

A resilient synthetic cap can be moved quickly and replaced easily.

Specialty Orders Steady — One machine company uses transparent plastic valves to troubleshoot problems in designing filling machines for the packaging industry. They allow engineers to see with their own eyes where trouble spots are. The transparent plastic valves are also useful in sales promotion.

By and large, the makers of specialty valves report that orders have been holding a fairly even keel for the past five or six years. A made-to-order valve may take anywhere from two weeks to six months to deliver, depending on its complexity.



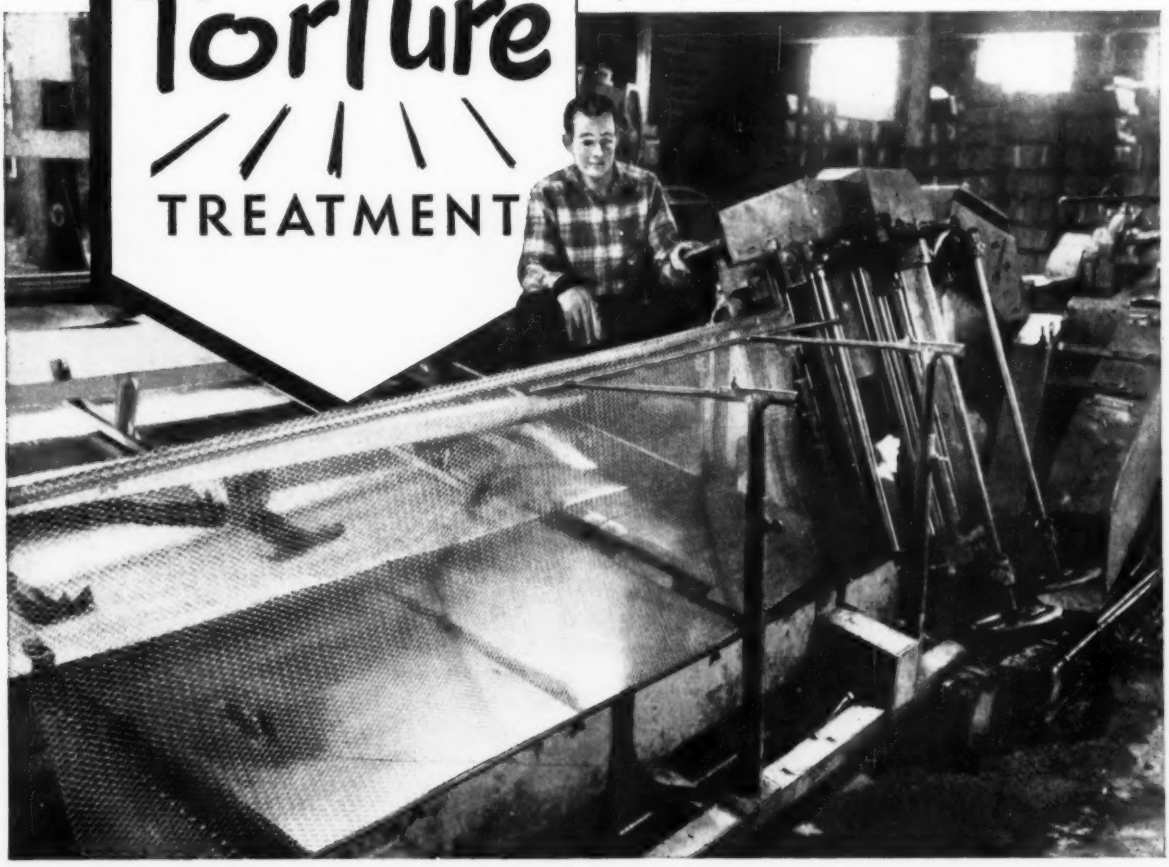
EASY TO REACH: Maintenance man has no trouble reaching gas cocks on front-fired boilers. These valves, consisting of 1-in. lubricated plugs and adapted to chain operation, are made by Rockwell Mfg. Co.

Prices

Decreases of $3 per gross ton in the price of bright (top grade) sulphur and $2.50 per gross ton for dark sulphur are announced by Texas Gulf Sulphur Co. New prices: Bright sulphur—$23.50 a ton, f.o.b. mine, and dark sulphur —$23 a ton, f.o.b. mine.

Torture TREATMENT

Photograph of the lath referred to which before expanding was galvanized by the continuous process.



but it doesn't damage this galvanizing

Visualize, if you will, a strip of galvanized steel 9 inches wide and slitted across the width with 1/16 inch spacing.

Now picture this same 9 inch strip 'expanded' into a lattice-like sheet 27 inches wide, *without any damage to the zinc coating* . . . without cracking, peeling, chipping! Just the same strong bond between steel and zinc as when the strip came out of the CONTINUOUS galvanizing unit.

Note the emphasis on the word 'continuous.' This is the secret of such durable galvanizing. Hot dipped sheets cannot possibly withstand such torture treatment. Continuous galvanizing can but it does require specially alloyed zinc to make the continuous process successful. St. Joe Electrothermic Zinc is just such a zinc. It is widely used in the galvanizing industry.

ST. JOSEPH LEAD COMPANY 250 PARK AVENUE, NEW YORK 17, N. Y.

HIGH GRADE
INTERMEDIATE
PRIME WESTERN

ST. JOE *electrothermic* ZINC

Tool Steel Prices Are Increased

Higher prices, some representing an advance of 6 cents per pound, will go into effect on Oct. 1.

In other moves, some ferroalloys are advanced in price; ferromanganese is dropped one-half cent a pound.

■ Users of high speed and tool steels can expect to pay more for them beginning Oct. 1.

Base price increases effective that date have been made by the Crucible Steel Co. of America. Other producers are expected to make similar announcements.

Representative new prices (advanced 6 cents a lb) are as follows: T-1—$1.74; T-2—$1.905; T-4—$2.445; M-1—$1.10; M-2—$1.245; and M-3—$1.49.

Crucible, in making the first general hike in its tool steel prices since last August, stated some extra charges will be increased, some will remain the same, and others will be decreased.

Other Price Changes — Electro Metallurgical Co., Div. of Union Carbide Corp. will advance, effective Oct. 1, some chromium and silicon alloy prices. High-carbon ferrochrome goes up one cent per pound of contained chromium. "Simplex" low-carbon ferrochrome is increased two cents per pound of chromium. Price of 50 pct ferrosilicon moves up 1.2 cents per pound of contained silicon. Ferrochrome-silicon will now be sold on the basis of the chromium plus the silicon contained in the alloy. Prices for regular low-carbon ferrochrome are revised to cover two new carbon grades (max. 0.025 and 0.05 pct carbon).

In another price move major producers of ferromanganese have dropped its price from 12.75 cents per lb to 12.25 cents per lb.

Delivery Promises at a Glance

	Pittsburgh	Chicago	Cleveland	Detroit	East	West Coast
CR Carbon Sheet	3-5 wks	5-7 wks	6 wks	4-6 wks	3-6 wks	6-8 wks
HR Carbon Sheet	2-5 wks	3-6 wks	5 wks	3-5 wks	2-3 wks	6-8 wks
CR Carbon Strip	2-3 wks	4-5 wks	2 wks	4-6 wks	2-4 wks	4-6 wks
HR Carbon Strip	2-3 wks	3-4 wks	2 wks	4-6 wks	2-3 wks	10 wks
HR Carbon Bars	2-3 wks	1-3 wks	2-4 wks	3-5 wks	3-5 wks	2-3 wks
CF Carbon Bars	2-6 wks	1-4 wks	2 wks	1-2 wks	1-2 wks	2-3 wks
Heavy Plate	Quota	Quota			Quota	Quota
Light Plate	3-4 wks	3-6 wks	4 wks		3-4 wks	Quota
Merchant Wire	1 week		1-2 wks		Wk or less	4 wks
Oil Country Goods	4-16 wks	6 wks	Quota		4-16 wks	
Linepipe	1959				1959-60	Quota
Buttweld Pipe	1 week			2-3 wks	1 week	4-5 wks
Structurals	Quota	Quota		10-12 wks	Quota	6 wks
CR Stainless Sheet	2-6 wks		1-2 wks	1-8 wks	3-4 wks	
CR Stainless Strip	2-6 wks		1-2 wks	1-8 wks	3-5 wks	

Light Plate — Customer interest in this product, especially at the warehouse level, is ebbing. Some users are reported reselling tonnage they picked up from the mills. Warehouse inventories are high.

Structurals — Lighter structurals continue to show easing in demand with mill delivery times shortening as a result. Fabricator needs for structurals are off as they get fewer construction jobs to bid on. **West Coast** mills report structural backlogs are fading and order inquiries are off. Wide flange beams, however, continue tight in most areas as many mills operate with 30 to 60 day carryovers on orders.

Bar — With automotive buying weaker for bar than sheet, the bar market continues dull. Hot-rolled is showing a little more life than cold finished. However, deliveries in the **Pittsburgh** area on the product are 2-3 weeks, at **Chicago** they are 3-4 weeks.

Pipe and Tubing—Some easing in the market for oil country seamless has reduced buyer interest in sub-standard pipe and pipe requiring further processing. There's variation in the oil country market, however, as oil drillers are heavily stocked on some items, short on others. Smaller drill pipe is still popular. The lag in sale of mechanical tubing is giving mills more space to turn out seamless. Standard pipe is relatively easy, especially in the smaller sizes. Buttweld is very weak. Linepipe, however, is booked solid into 1959 and 1960. On the **West Coast,** mills report buttweld pipe in sizes $\frac{1}{8}$ in. through 4 in. is very slow. Seamless pipe buyers there can get product in sizes through 12 in. fairly easily, but in the 14 in. and over range it's still tough to find.

Iron Ore—Lake Superior district shipments are running 15.6 million tons ahead of last year according to the American Iron Ore Assn., Cleveland. Shipments so far this season are 63.7 million tons compared with 48.1 million tons at the same time last year.

COMPARISON OF PRICES

(Effective Sept. 24, 1957)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in **Heavy Type**; declines appear in *Italics*.

	Sept. 24 1957	Sept. 17 1957	Aug. 27 1957	Sept. 25 1956
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.925¢	4.925¢	4.925¢	4.675¢
Cold-rolled sheets	6.05	6.05	6.05	5.75
Galvanized sheets (10 ga.)	6.60	6.60	6.60	6.30
Hot-rolled strip	4.925	4.925	4.925	4.675
Cold-rolled strip	7.17	7.17	7.17	6.870
Plate	5.12	5.12	5.12	4.87
Plates, wrought iron	13.15	13.15	13.15	10.40
Stain'l's C-R strip (No. 302)	52.00	52.00	52.00	47.50
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$10.30	$10.30	$10.30	$9.85
Tin plates, electro (0.50 lb.)	9.00	9.00	9.00	8.55
Special coated mfg. ternes	9.55	9.55	9.55	9.10
Bars and Shapes: (per pound)				
Merchant bar	5.425¢	5.425¢	5.425¢	5.075¢
Cold finished bars	7.30	7.30	7.30	6.85
Alloy bars	6.475	6.475	6.475	6.125
Structural shapes	5.275	5.275	5.275	5.00
Stainless bars (No. 302)	45.00	45.00	45.00	40.75
Wrought iron bars	14.45	14.45	14.45	11.50
Wire: (per pound)				
Bright wire	7.65¢	7.65¢	7.65¢	7.20¢
Rails: (per 100 lb.)				
Heavy rails	$5.525	$5.525	$5.525	$5.075
Light rails	6.50	6.50	6.50	6.00
Semifinished Steel: (per net ton)				
Rerolling billets	$77.50	$77.50	$77.50	$74.00
Slabs, rerolling	77.50	77.50	77.50	74.00
Forging, billets	96.00	96.00	96.00	91.50
Alloy blooms, billets, slabs	114.00	114.00	114.00	107.00
Wire Rod and Skelp: (per pound)				
Wire rods	6.15¢	6.15¢	6.15¢	5.80¢
Skelp	4.875	4.875	4.875	4.225
Finished Steel Composite: (per pound)				
Base price	5.967¢	5.967¢	5.967¢	5.622¢

	Sept. 24 1957	Sept. 17 1957	Aug. 27 1957	Sept. 25 1956
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.51	$70.51	$70.51	$67.76
Foundry, Valley	66.50	66.50	66.50	63.00
Foundry, Southern Cin'ti	71.65	71.65	71.65	67.17
Foundry, Birmingham	62.50	62.50	62.50	59.00
Foundry, Chicago	66.50	66.50	66.50	63.00
Basic, del'd Philadelphia	70.01	70.01	70.01	66.84
Basic, Valley furnace	66.00	66.00	66.00	62.50
Malleable, Chicago	66.50	66.50	66.50	63.00
Malleable, Valley	66.50	66.50	66.50	63.00
Ferromanganese, cents per lb‡	12.75	12.75	12.75	10¾-11¾

74 to 76 pct Mn base.

Pig Iron Composite: (per gross ton)				
Pig iron	$66.42	$66.42	$66.42	$63.04
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	54.50	$48.50	$53.50	$58.00
No. 1 steel, Phila. area	52.50	45.00	50.50	58.00
No. 1 steel, Chicago	52.50	46.50	50.50	58.50
No. 1 steel, Detroit	51.50	43.50	50.50	56.50
Low phos., Youngstown	54.00	53.50	55.50	66.50
No. 1 mach'y cast, Pittsburgh	55.50	57.50	59.50	60.50
No. 1 mach'y cast, Philadel'a	56.50	56.50	56.50	58.50
No. 1 mach'y cast, Chicago	56.50	48.50	53.50	59.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	53.83	$46.67	$51.50	$58.17
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$15.38	$15.38	$15.88	$14.50
Foundry coke, prompt	$17.50-$19	$17.50-$19	$17.50-$19	$17.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	27.00	27.00	28.50	40.00
Copper, Lake, Conn.	27.00	27.00	28.50	40.00
Tin, Straits, N. Y.	94.50†	93.625*	93.50	104.875
Zinc, East St. Louis	10.00	10.00	10.00	13.50
Lead, St. Louis	13.80	13.80	13.80	15.80
Aluminum, virgin ingot	28.10	28.10	28.10	27.10
Nickel, electrolytic	74.00	74.00	74.00	64.50
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	33.00	33.00	33.00	33.00

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Averages of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	
Birmingham *R3*	62.00	62.50*			
Birmingham *W9*	62.00	62.50*	66.50		
Birmingham *U4*	62.00	62.50*	66.50		
Buffalo *R3*	66.00	66.50	67.00	67.50	
Buffalo *H1*	66.00	66.50	67.00	67.50	
Buffalo *W6*	66.00	66.50	67.00	67.50	
Chester *P2*	66.50	67.00	67.50		
Chicago *I4*	66.00	66.50	66.50	67.00	
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Everett *M6*	66.50	67.00	67.50		
Fontana *K1*	75.00	75.50			
Geneva, Utah *C7*	66.00	66.50			
Granite City *G2*	67.90	68.10	68.90		
Hubbard *Y1*			66.50		
Ironton, Utah *C7*	66.00	66.50			
Midland *C11*	66.00				
Minnequa *C6*	68.00	68.50	69.00		
Monessen *P6*	66.00				
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*		66.50	67.00	67.50	
Sharpsville *S1*	66.00	66.50	66.50	67.00	
So. Chicago *R3*	66.00	66.50	66.50		
So. Chicago *W8*	66.00		66.50	67.00	
Swedeland *A2*	68.00	68.50	69.00	69.50	
Toledo *I4*	66.00	66.50	66.50	67.00	
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	74.00
Youngstown *Y1*			66.50	67.00	

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct); 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31 0.69 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4* (Globe Div.), $78.00; Niagara Falls (15.01 15.50), $101.00; Keokuk (14.01 14.50), $103.50; (15.51 16.00), $106.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add $1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.): $64.00. Add $1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

Base price cents per lb f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.00	23.75	23.25	25.25	—	27.00	39.75	32.25	37.00	—	16.75	—	17.00
Slabs, billets	27.00	27.00	28.00	31.50	32.00	33.25	49.50	40.00	46.50		21.50	—	21.75
Billets, forging		36.50	37.25	38.00	41.00	40.50	62.25	47.00	55.75	32.00	28.25	28.75	28.75
Bars, struct.	42.00	43.00	44.25	45.00	48.00	47.75	73.00	55.50	64.75	37.75	33.75	34.25	34.25
Plates	44.25	45.00	46.25	47.25	50.00	50.75	76.75	59.75	69.75	40.25	35.00	36.75	36.00
Sheets	48.50	49.25	51.25	52.00	—	55.50	81.50	65.50	79.25	48.25	40.25	—	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50		31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	—	55.50	81.50	65.50	79.25	48.25	40.25		40.75
Wire CF; Rod HR	40.00	40.75	42.00	42.75	45.50	45.25	69.75	52.50 52.75	61.50	35.75	32.00	32.50	32.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; Vandergrift, Pa., *U1*; Washington, Pa., *W2*, *J2*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*.

Strip: Midland, Pa., *C11*; Waukegan, Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton Massillon, O., *R4*; Harrison, N. J., *D3*; Youngstown, *I4*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U3* (plus further conversion extras); *W1*; New Bedford, Mass. (.25¢ per lb higher), *R6*; Gary, *U1* (.25¢ per lb higher).

Bar: Baltimore, *A7*; S. Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1*, *F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R3*; S. Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A5*; Waukegan, *A5*; Canton, O., *T5*, *R3*; Ft. Wayne, *I4*; Detroit, *R3*; Gary, *U1*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *I4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *I4*; Watervliet, N. Y., *A5*; Syracuse, *C11*; S. Chicago, *U1*.

Plates: Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Vandergrift, Pa., *U1*; Gary, *U1*.

Forging billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R4*; Watervliet, *A5*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*; Detroit, *R4*; Munhall, Pa., S. Chicago, *U1*.

To identify producers see Key on p. 189

No Bottom Yet In Scrap Decline

BULLETIN

Industrial bundles prices dropped sharply this week, forcing last-minute declines in Detroit, Cleveland, Pittsburgh, and Youngstown. Tabulated scrap prices on page 80 reflect these changes; datelined comments do not. The IRON AGE Composite price dropped to $43.83.

■ "Demoralized," is the way one Midwest scrap dealer describes the market. Few in the trade would question that conclusion.

Prices are down in every major market, continuing the downslide that has gained speed for several weeks. What makes matters worse for dealers, they can't see anything but even lower prices.

The current collapse of the market is more remarkable in that it occurs when most had expected a firming market. Now, there is no optimism about the October market.

There is some cheer over the prospect of strengthening steel operations in the weeks ahead. But this is counterbalanced by the much greater tonnage posted for the October auto scrap lists, when new model production gets going.

If bids on the auto lists are down, it will further weaken the market. In addition, larger tonnages of the choice automotive scrap will have a depressing effect on the dealer market.

Pittsburgh — Scrap prices continue to drop. Openhearth grades are off $2. Low phos and industrial bundles are down $4. Turnings, railroad grades and cast are off $1 to $4. Trading has been to light to establish a firm market level for any grade, but all signs are still downward. Successive orders for low phos were at $55 and $52. Brokers have been able to buy No. 1 heavy melting at $45 and $44 on old orders.

Chicago — In a dull market, prices slipped again on small, scattered purchases. Broker selling offers continued to decline. Dealer offering prices failed to respond to a report that a No. 2 dealer bundle purchase might be in the offing. Optimism regarding an October upturn has vanished completely.

Philadelphia — Prices dropped again in a very slow market. No. 1 heavy steelmaking tumbled $2.50, down to $42-$43. Scrap intake in dealer yards is slowing down to a crawl. Export buyers are standing on the sidelines waiting for still lower prices which everybody seems to think are coming.

New York—Prices continue to fall in this area. Export business is very dull, and the one or two mills that are in the market are able to push prices down. No. 1 heavy melting is now at a top of $42. No. 2 bundles are $30 to $31, with dealers refusing to sell below $30. Cast grades are off $2 a ton. Turnings are not moving, but the trade insists sales will have to be made at about current prices. No. 2 bundles were incorrectly quoted on scrap price page Sept. 19. Correct price was $31 to $32.

Detroit—The market continues its downhill slide with prices dropping $1 to $2. Dealer orders for September have been few and far between. It doesn't look much better for October, when industrial plants are expected to generate considerably more scrap.

Cleveland—Cleveland and the Valley markets settled another $2 on prime grades on appraisal of lack of orders and general lethargy. Major interest centers around local auto lists. Tonnage is up for October and the prices are expected to be down.

St. Louis—Following the pattern of other markets, scrap prices are down from $1 to $4. Flow of scrap to this market continues steady, but there is no new mill buying. Price of No. 1 heavy melting was incorrectly quoted Sept. 19. Correct price was $47 to $48.

Birmingham — With production cut back at mills and foundries, the market is very weak. There is little buying and those placing any orders are doing so for small quantities and for quick shipment at reduced prices.

Cincinnati — The market is off another $2 on appraisal on prime grades. But dealers here aren't getting panicky. Some isolated sales have been made on low phos and prime rail grades.

Buffalo—No. 1 grades are off $2 a ton on appraisal as this market continues inactive. Dealers feel other grades will be down if any buying is done around Oct. 1.

Boston—The market is extremely weak and virtually all prices are down. Domestic demand is nil and export is also at a standstill.

West Coast—This market continues weak. One bright spot: The Japanese might re-enter the market with a request for 180-day credit. In the Sept. 19 issue, some turnings prices were incorrectly quoted. Machine shop turnings in Los Angeles on that date were $20 a ton; shoveling turnings $24. Machine shop turnings in San Francisco should have read $30 to $32.

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SCRAP PRICES *(Effective Sept. 24, 1957)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$44.00 to $45.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 dealer bundles	44.00 to 45.00
No. 1 factory bundles	49.00 to 50.00
No. 2 bundles	35.00 to 36.00
No. 1 busheling	44.00 to 45.00
Machine shop turn.	26.00 to 27.00
Mixed bor. and turn.	26.00 to 27.00
Shoveling turnings	26.00 to 27.00
Cast iron borings	26.00 to 27.00
Low phos. punch'gs plate	49.00 to 50.00
Heavy turnings	29.00 to 30.00
No. 1 RR hvy. melting	49.00 to 50.00
Scrap rails, random lgth.	64.00 to 65.00
Rails 2 ft and under	70.00 to 71.00
RR steel wheels	61.00 to 62.00
RR spring steel	61.00 to 62.00
RR couplers and knuckles	61.00 to 62.00
No. 1 machinery cast	55.00 to 56.00
Cupola cast	46.00 to 47.00
Heavy breakable cast	44.00 to 45.00

Chicago

No. 1 hvy. melting	$44.00 to $45.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 dealer bundles	45.00 to 46.00
No. 1 factory bundles	50.00 to 51.00
No. 2 bundles	30.00 to 32.00
No. 1 busheling	44.00 to 45.00
Machine shop turn.	24.00 to 25.00
Mixed bor. and turn.	26.00 to 27.00
Shoveling turnings	26.00 to 27.00
Cast iron borings	26.00 to 27.00
Low phos. forge crops	55.00 to 56.00
Low phos. punch'gs plate	51.00 to 52.00
Low phos. 3 ft and under	50.00 to 51.00
No. 1 RR hvy. melting	50.00 to 51.00
Scrap rails, random lgth.	57.00 to 58.00
Rerolling rails	62.00 to 63.00
Rails 2 ft and under	61.00 to 62.00
Locomotive tires cut	55.00 to 56.00
Cut boilers & side frames	56.00 to 57.00
Angles and splice bars	59.00 to 60.00
RR steel car axles	65.00 to 66.00
RR couplers and knuckles	55.00 to 56.00
No. 1 machinery cast	46.00 to 47.00
Cupola cast	41.00 to 42.00
Heavy breakable cast	39.00 to 40.00
Cast iron brake shoe	41.00 to 42.00
Cast iron wheel	47.00 to 48.00
Malleable	54.00 to 55.00
Stove plate	39.00 to 40.00
Steel car wheels	55.00 to 56.00

Philadelphia Area

No. 1 hvy. melting	$42.00 to $43.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 dealer bundls	44.00 to 45.00
No. 2 bundles	33.00 to 34.00
No. 1 busheling	44.00 to 45.00
Machine shop turn.	25.00 to 26.00
Mixed bor. short turn.	27.00 to 28.00
Cast iron borings	27.00 to 28.00
Shoveling turnings	29.00 to 30.00
Clean cast chem. borings	39.00 to 40.00
Low phos. 3 ft and under	50.00 to 51.00
Low phos. 2 ft and under	51.00 to 52.00
Low phos. punchings	51.00 to 52.00
Elec. furnace bundles	46.00 to 47.00
Heavy turnings	38.00 to 39.00
RR steel wheels	62.50 to 63.50
RR spring steel	62.50 to 63.50
Rails 18 in. and under	70.00 to 71.00
Cupola cast	43.00 to 44.00
Heavy breakable cast	48.00 to 49.00
Cast iron car wheels	56.00 to 57.00
Malleable	60.00 to 61.00
Unstripped motor blocks	34.00 to 35.00
No. 1 machinery cast	56.00 to 57.00

Cleveland

No. 1 hvy. melting	$39.50 to $40.50
No. 2 hvy. melting	33.50 to 34.50
No. 1 dealer bundles	39.50 to 40.50
No. 1 factory bundles	45.50 to 46.50
No. 2 bundles	30.50 to 31.50
No. 1 busheling	39.50 to 40.50
Machine shop turn.	18.00 to 19.00
Mixed bor. and turn.	23.00 to 24.00
Shoveling turnings	23.00 to 24.00
Cast iron borings	23.00 to 24.00
Cut struct'l & plates, 2 ft & under	45.50 to 46.50
Drop forge flashings	39.50 to 40.50
Low phos. punch'gs, plate	40.50 to 41.50
Foundry steel, 2 ft & under	44.50 to 45.50
No. 1 RR heavy melting	49.00 to 50.00
Rails 2 ft and under	68.00 to 69.00
Rails 18 in. and under	69.00 to 70.00
Railroad grate bars	27.00 to 28.00
Steel axle turnings	28.00 to 29.00
Railroad cast	51.00 to 52.00
No. 1 machinery cast	51.00 to 52.00
Stove plate	45.00 to 46.00
Malleable	57.00 to 58.00

Youngstown

No. 1 hvy. melting	$42.50 to $43.50
No. 2 hvy. melting	36.50 to 37.50
No. 1 dealer bundles	42.50 to 43.50
No. 2 bundles	33.50 to 34.50
Machine shop turn.	23.00 to 24.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	27.00 to 28.00
Low phos. plate	43.50 to 44.50

Buffalo

No. 1 hvy. melting	$47.00 to $48.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 busheling	47.00 to 48.00
No. 1 dealer bundles	47.00 to 48.00
No. 2 bundles	33.00 to 34.00
Machine shop turn.	25.00 to 26.00
Mixed bor. and turn	30.00 to 31.00
Shoveling turnings	32.50 to 33.50
Cast iron borings	31.00 to 32.00
Low phos. plate	51.00 to 52.00
Scrap rails, random lgth.	57.00 to 58.00
Rails 2 ft and under	67.00 to 68.00
RR steel wheels	54.00 to 55.00
RR spring steel	50.00 to 51.00
RR couplers and knucklers	50.00 to 51.00
No. 1 machinery cast.	51.00 to 52.00
No. 1 cupola cast.	46.00 to 47.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$41.00 to $42.00
No. 2 hvy. melting	**34.00 to 35.00**
No. 1 dealer bundles	41.00 to 42.00
No. 2 bundles	30.00 to 31.00
No. 1 busheling	40.00 to 41.00
Drop forge flashings	40.00 to 41.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	21.00 to 22.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	21.00 to 22.00
Low phos. punch'gs plate	43.00 to 44.00
No. 1 cupola cast	43.00 to 44.00
Heavy breakable cast	39.00 to 40.00
Stove plate	39.00 to 40.00
Automotive cast	49.00 to 50.00

St. Louis

No. 1 hvy. melting	$47.00 to $48.00
No. 2 hvy. melting	**44.00 to 45.00**
No. 1 dealer bundles	47.00 to 48.00
No. 2 bundles	38.00 to 39.00
Machine shop turn.	25.00 to 26.00
Cast iron borings	27.00 to 28.00
Shoveling turnings	27.00 to 28.00
No. 1 RR heavy melting	50.00 to 51.00
Rails, random lengths	62.00 to 63.00
Rails 18 in. and under	67.00 to 68.00
Locomotive tires uncut	58.00 to 59.00
Angles and splice bars	57.00 to 58.00
Std. steel car axles	61.00 to 62.00
RR specialties	56.00 to 57.00
Cupola cast	48.00 to 49.00
Heavy breakable cast	41.00 to 42.00
Cast iron brake shoes	41.00 to 42.00
Stove plate	41.00 to 42.00
Cast iron car wheels	47.00 to 48.00
Rerolling rails	67.00 to 68.00
Unstripped motor blocks	42.00 to 43.00

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	27.00 to 28.00
No. 1 busheling	36.00 to 37.00
Elec. furnace, 3 ft & under	43.00 to 44.00
Machine shop turn	15.00 to 16.00
Mixed bor. and short turn	17.00 to 18.00
Shoveling turnings	19.00 to 21.00
Clean cast. chem. borings	27.00 to 28.00
No. 1 machinery cast	38.00 to 39.00
Mixed cupola cast	33.00 to 34.00
Heavy breakable cast	37.00 to 38.00
Stove plate	30.00 to 31.00
Unstripped motor blocks	31.00 to 32.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$41.00 to $42.00
No. 2 hvy. melting	34.00 to 35.00
No. 2 dealer bundles	30.00 to 31.00
Machine shop turn.	17.00 to 18.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	20.00 to 21.00
Clean cast. chem. borings	34.00 to 35.00
No. 1 machinery cast	41.00 to 42.00
Mixed yard cast	36.00 to 37.00
Charging box cast	39.00 to 40.00
Heavy breakable cast	39.00 to 40.00
Unstripped motor blocks	31.00 to 32.00

Birmingham

No. 1 hvy. melting	$46.00 to $47.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 dealer bundles	46.00 to 47.00
No. 2 bundles	29.00 to 30.00
No. 1 busheling	46.00 to 47.00
Machine shop turn.	31.00 to 32.00
Shoveling turnings	33.00 to 34.00
Cast iron borings	27.00 to 28.00
Electric furnace bundles	47.00 to 48.00
Elec. furnace, 3 ft & under	45.00 to 46.00
Bar crops and plate	50.00 to 51.00
Structural and plate, 2 ft	49.00 to 50.00
No. 1 RR hvy. melting	49.00 to 50.00
Scrap rails, random lgth.	51.00 to 52.00
Rails, 18 in. and under	57.00 to 58.00
Angles & splice bars	54.00 to 55.00
Rerolling rails	62.00 to 63.00
No. 1 cupola cast	52.00 to 53.00
Stove plate	52.00 to 53.00
Charging box cast	37.00 to 38.00
Cast iron car wheels	43.00 to 44.00
Unstripped motor blocks	41.00 to 42.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$45.00 to $46.00
No. 2 hvy. melting	40.00 to 41.00
No. 1 dealer bundles	45.00 to 46.00
No. 2 bundles	32.00 to 33.00
Machine shop turn.	27.00 to 28.00
Mixed bor. and turn.	24.00 to 25.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	24.00 to 25.00
Low phos., 18 in. and under	52.00 to 53.00
Rails, random lengths	60.00 to 61.00
Rails, 18 in. and under	69.00 to 70.00
No. 1 cupola cast	42.00 to 43.00
Hvy. breakable cast	40.00 to 41.00
Drop broken cast	52.00 to 53.00

San Francisco

No. 1 hvy. melting	$44.00
No. 2 hvy. melting	42.00
No. 1 dealer bundles	43.00
No. 2 bundles	35.00
Machine shop turn	$30.00 to 32.00
Cast iron borings	30.00 to 32.00
No. 1 RR hvy. melting	51.00
No. 1 cupola cast	52.00

Los Angeles

No. 1 hvy. melting	$44.00
No. 2 hvy. melting	42.00
No. 1 dealer bundles	43.00
No. 2 bundles	35.00
Machine shop turn.	26.00
Shoveling turnings	24.00
Cast iron borings	32.00
Elec. furn. 1 ft and under (foundry)	55.00
No. 1 RR hvy. melting	44.00
No. 1 cupola cast	48.00

Seattle

No. 1 hvy. melting	$44.00
No. 2 hvy. melting	42.00
No. 2 bundles	33.00
No. 1 cupola cast	38.00
Mixed yard cast	38.00

Hamilton, Ont.

No. 1 hvy. melting	$47.00
No. 2 hvy. melting	42.00
No. 1 dealer bundles	47.00
No. 2 bundles	36.00
Mixed steel scrap	42.00
Busheling	36.00
Bush., new fact., prep'd	47.00
Bush., new fact., unprep'd	41.00
Machine shop turn.	22.00
Short steel turn.	30.00
Mixed bor. and turn.	24.00
Rails, rerolling	56.00
Cast scrap	52.00

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EXPORTS-IMPORTS LIVINGSTON & SOUTHARD, INC. 99 Park Ave., New York, N. Y. *Cable Address:* **FORENTRACO**

Nicaro Plant Goes On the Market

Government-owned nickel plant will be offered at auction.

National Lead, which has been operating the facility, is a likely purchaser. But other companies in and out of the field have lively interests.

Esso will market oil in aluminum cans. Reynolds will supply the metal.

■ After toying with the idea for most of the year, the government has finally decided to put its nickel plant in Nicaro, Cuba, on the block.

Specific bid proposals are scheduled to be put out by General Services Administration very soon. Industrial firms will be able to bid on buying or leasing the $85 million facility.

More Available—Disposal of the plant is authorized by the Defense Dept., because of the increasing nickel capacity of private firms, substantial planned expansions of private installations, and the healthy state of the nickel stockpile.

Title to the plant and some ore bodies is vested in the Cuban Nickel Co., a Cuban corporation of which the U. S. government owns all the stock. It has been operated for the government by private interests since 1952.

At a Profit—Nickel Processing Corp. currently operates Nicaro. About three-quarters of NPC stock is held by the National Lead Co. Under this management, capacity was boosted in 1956 to 50 million lb per year. It is currently operating slightly over capacity, and at a profit, says GSA.

It is understood that no matter what course of action is decided on, the government will retain mobilization rights to the plant's output in case of any emergency.

Nicaro produces a high grade of nickel oxide in powder and sinter form. Since 1956, some of the oxide has been converted into metallic nickel at a private plant. But a pilot plant is now under construction at Nicaro to develop techniques along this line.

Plenty of Bidders—Waiting until now, when the nickel supply situation looks considerably brighter, will undoubtedly mean fewer bidders and lower offered prices. However, there is no shortage of bidders in the cards.

Prominently mentioned in trade talk are National Lead Co., because it has been operating the plant and knows, perhaps better than anyone, its capabilities; and Bethlehem Steel Co., which owns extensive nickel-bearing ore deposits in Cuba.

And the lure of an integrated installation with established markets will probably prompt bids from companies not now in nickel but interested in diversifying, as well as from groups specially formed for this purpose.

Diecasting

Despite the wailing of some diecasters about soft business this year, the American Die Casting Institute figures that when all the returns are in, 1957 will turn out to be better for aluminum castings and just about as good for zinc as 1956.

The forecast: 385 million lb of aluminum castings will be used (about 18 million lb over the record level of 1956); 362,000 tons of zinc castings (same as last year, topped only by the 410,000 tons used in 1955).

In addition, about 29 million lb of aluminum will be used in zinc castings as an alloying agent.

Aluminum

Esso Standard Oil Co. and Reynolds Metals Co. this week signed an agreement to utilize aluminum oil cans. This is believed to be the first use of aluminum oil cans by the U. S. oil industry and opens up a big new field for aluminum.

The contract calls for 35 to 60 million quart-sized cylindrical motor oil cans, with Reynolds to supply the metal. B. L. Ray, vice president of Esso, said the contract will handle a year's requirements of Esso's motor-oil packaging plant at its Bayonne, N. J., refinery.

Reynolds has made arrangements with American Can Co., Continental Can Co., and Crown Cork & Seal Co. to make the cans from aluminum sheet.

Tin prices for the week: Sept. 18 — 93.875; Sept. 19 — 93.625; Sept. 20—93.625; Sept. 23—93.50; Sept. 24—93.50*.

*Estimate.

Primary Prices

(cents per lb)	Current price	last price	date of change
Aluminum ingot	28.10	27.10	8 1 57
Aluminum pig	26.00	25.00	9 1 57
Copper (E)	27.00	28.50	9 3 57
Copper (CS)	26.00	25.50	9 13 57
Copper (L)	27.00	28.50	9 3 57
Lead, St. L.	13.80	14.80	6 11 57
Lead, N. Y.	14.00	15.00	6 11 57
Magnesium ingot	36.00	34.09	8 13 56
Magnesium pig	35.25	33.75	8 13 56
Nickel	74.00	64.50	12 6 56
Titanium sponge	165 250	165 225	5 5 57
Zinc, E. St. L.	10.00	10.50	7 1 57
Zinc, N. Y.	10.50	11.00	7 1 57

ALUMINUM: 99% ingot frt allwd. **COPPER**: (E) = electrolytic, (CS) = custom smelters, electrolytic, (L) = lake. **LEAD**: common grade. **MAGNESIUM**: 99.8% pig. Velasco, Tex. **NICKEL**: Port Colbourne, Canada. **ZINC**: prime western. **TIN**: see above; other primary prices, pg. 184.

Modern electronically controlled slitters give you exact, clean-edged widths. Speeds up to 700 linear feet per minute are another factor in prompt service.

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Minimum $\frac{3}{8}$ inch

IN THESE THICKNESSES: Maximum 0.064 inch
Minimum .006 inch

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ARBOR SIZES: 4, 6, 8, 10, 12, 16, and 20 inches in diameter

ALLOYS: 1100, 3003, 3004, 5005, 5050, 5052

TEMPERS: Alloy Nos. 1100, 3003, 5005
–O, –H12, –H14, –H16, –H18
Alloy Nos. 3004, 5005, 5050, 5052
–O, –H32, –H34, –H36, –H38

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Flat Sheet (Mill Finish) and Plate

(Temper except 6061-0)

Alloy	1060	1100	2024	2014	2219	3003	3004	5052	5083	5086	5154	5456	6061	6062	7075
0	46.6	44.3	52.6	52.6	52.6	47.7	52.6	49.4	57.2	52.6	49.4	57.2	49.4	49.4	57.2
H12	51.6	48.9	57.2	57.2	57.2	52.7	57.2	54.4	61.8	57.2	54.4	61.8	54.4	54.4	61.8
H14	56.4	53.6	61.8	61.8	61.8	57.6	61.8	59.3	65.8	61.8	59.3	65.8	59.3	59.3	65.8
H16															
H18															
H32	49.6	47.3	55.6	55.6	55.6	50.7	55.6	52.4	59.8	55.6	52.4	59.8	52.4	52.4	59.8
H34	53.6	51.0	59.8	59.8	59.8	54.8	59.8	56.6	63.8	59.8	56.6	63.8	56.6	56.6	63.8
H36	56.4	53.6	61.8	61.8	61.8	57.6	61.8	59.3	65.8	61.8	59.3	65.8	59.3	59.3	65.8
H38															

Extruded Solid Shapes

Factor	1060 T-5	6062 T-6
6	45.0-46.8	60.4-64.1
12-14	45.7-47.2	61.3-65.8
24-26	46.0-49.5	72.1-76.8
36-38	58.0-58.9	96.2-99.8

Screw Machine Stock—2011-T-3

Size"	¼	⅜-⅝	¾-1	1¼-1½
Price	63.0	62.5	61.0	58.6

Roofing Sheet, Corrugated

(Per sheet, 26" wide basis, 16,000 lb)

Length"	72	96	120	144
.019 gage	$1.420	$1.893	$2.367	$2.839
.024 gage	1.774	2.366	2.957	3.549

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type	Gage	250	220	188	081	032
		3.00	2.90			
AZ31B Stand. Grade			67.9	69.0	77.9	108.1
AZ31B Spec			80.3	95.7	108.7	131.3
Tread Plate			20.6	21.7		
Tooling Plate		73.0				

Extruded Shapes

Factor	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	69.6	70.7	75.6	89.2
Spec. Grade (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) ..... 40.25 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	126	106	128
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	120	105	121
Seamless tube	157	129	200
Shot, blocks		84	

COPPER, BRASS, BRONZE

(Freight carloaded on 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	49		46.36	49.32
Brass, 70/30	45.62	47.56	44.26	45.93
Brass, Low	45.50	46.04	45.14	48.31
Brass, H.T.	46.37	46.91	46.31	49.18
Brass, Naval	47.27		41.58	50.68
Muntz Metal	45.39		41.20	
Comm. Bz.	47.78	48.32	47.72	50.34
Mang. Bz.	51.40		45.11	
Phos. Bz. 5%	68.67		68.57	

Free Cutting Brass Rod 31.30

TITANIUM

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, $9.50-$10.60; alloy, $14.75; Plate, HR, commercially pure, $8.00-$8.75; alloy, $10.75. Wire, rolled and/or drawn, commercially pure, $7.50-$8.00; alloy $10.00; Bar, HR or forged, commercially pure, $6.15-$6.40; alloy, $6.15-$6.35; billets, HR, commercially pure, $6.00-$6.25; alloy, $6.00-$6.20.

PRIMARY METAL

(Cents per lb, unless otherwise noted)

Antimony, American, Laredo, Tex. 33.50
Beryllium aluminum, 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb cont'd Be $12.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.70
Calcium, 99.9%, small lots ..... $ 4.75
Chromium, 99.8% metallic basis ..... $ 1.31
Cobalt, 97-99% (per lb) ..... $2.00 to $2.07
Germanium, per kg, f.o.b. Miami, Okla., refined ..... $39.50 to $52.50
Gold, U. S. Treas. per troy oz. $35.00
Indium, 99.9%, dollars per troy oz. ..... $ 2.25
Iridium, dollars per troy oz. ..... $86 to $89
Lithium, 98% ..... $11.00 to $14.00
Magnesium, sticks, 100 to 400 lb. 59.00
Mercury, dollars per 76-lb flask, f.o.b. New York ..... $245 to $248
Nickel oxide sinter at Copper Cliff, Ont., contained nickel 71.25
Palladium, dollars per troy oz. ..... $23 to $24
Platinum, dollars per troy oz. ..... $82 to $87
Rhodium ..... $120.00 to $125.00
Silver ingots (c per troy oz.) 90.625
Thorium, per kg $43.00
Uranium, normal per kg $40.00
Vanadium ..... $ 3.45
Zirconium sponge $19.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot	
No. 115	27.75
No. 120	26.75
No. 123	25.25
80-10-10 ingot	
No. 305	31.75
No. 315	29.75
88-10-2 ingot	
No. 210	39.25
No. 215	33.00
No. 245	31.25
Yellow ingot	
No. 405	22.50
Manganese bronze	
No. 421	25.50

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper max.	25.75-26.50
0.60 copper max.	25.50-26.00
Piston alloys (No. 122 type)	23.25-25.00
No. 12 alum. (No. 2 grade)	22.25-23.00
108 alloy	22.75-23.50
195 alloy	25.25-26.25
13 alloy (0.60 copper max.)	25.50-26.00
AXS-679	22.75-23.50

(Effective Sept. 23, 1957)

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97½%	24.00-24.50
Grade 2—92-95%	22.00-22.50
Grade 3—90-92%	21.00-21.50
Grade 4—85-89%	19.00-20.00

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1c per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	22	22¼
Yellow brass	17⅞	15¾
Red brass	20¼	19½
Comm. bronze	21	20¼
Mang. bronze	16⅛	15⅜
Yellow brass rod ends	17⅝	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	21½
No. 2 copper wire	20
Light copper	17¾
*Refinery brass	18¾
Copper bearing material	17¾

*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	21½
No. 2 copper wire	20
Light copper	17½
No. 1 composition	18¾
No. 1 comp. turnings	18¾
Hvy. yellow brass solids	14
Brass pipe	17½
Radiators	14¾

Aluminum

Mixed old cast	14 —14½
Mixed new clips	16½— 17
Mixed turnings, dry	14½— 15½

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire	18 —18½
No. 2 copper wire	16 —16½
Light copper	14½— 15
Auto radiators (unsweated)	12¾— 12½
No. 1 composition	16 —16½
No. 1 composition turnings	15½—16
Cocks and faucets	12½— 13
Clean heavy yellow brass	11½—12
Brass pipe	13 —13½
New soft brass clippings	13½— 14
No. 1 brass rod turnings	11⅝— 12½

Aluminum

Alum. pistons and struts	5½— 6
Aluminum crankcases	11 —11½
1100 (2S) aluminum clippings	14 —14½
Old sheet and utensils	11 —11½
Borings and turnings	7 — 7½
Industrial castings	11 —11½
2024 (24S) clippings	12½— 13

Zinc

New zinc clippings	4 — 4½
Old zinc	3 — 3½
Zinc routings	1½— 2
Old die cast scrap	1½— 1⅝

Nickel and Monel

Pure nickel clippings	50-55
Clean nickel turnings	45-50
Nickel anodes	50-55
Nickel rod ends	50-55
New Monel clippings	37-40
Clean Monel turnings	25-30
Old sheet Monel	35-38
Nickel silver clippings, mixed	20
Nickel silver turnings, mixed	17

Lead

Soft scrap lead	9½— 10
Battery plates (dry)	4½— 4½
Batteries, acid free	2¾— 3

Miscellaneous

Block tin	75 — 76
No. 1 pewter	59 — 60
Auto babbitt	39 — 40
Mixed common babbitt	11 —11½
Solder joints	15½— 16
Siphon tops	42
Small foundry type	13 —13¼
Monotype	13 —13¼
Lino. and stereotype	12 —12½
Electrotype	11 —11¼
Hand picked type shells	8 — 8½
Lino. and stereo. dross	3¾— 4
Electro. dross	3 — 3½

For the **BEST DEAL**

on Stainless Steel
and Nickel Alloy
SCRAP

1st in EXPERIENCE & SERVICE!

KLAFF

Ostend & Ridgely Sts.
Baltimore 30, Md.

PHONE: LEXINGTON 9-6721

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$114.00 *B3*		5.325 *B3*	7.80 *B3*	5.325 *B3*						
	Buffalo, N. Y.	$77.50 *R3, B3*	$96.00 *R3, B3*	$114.00 *R3, B3*	6.225 *B3*	5.325 *B3*	7.80 *B3*	5.325 *B3*	4.925 *R3, B3*	7.15 *S10*	7.325 *B3*			
	Phila., Pa.									7.70 *P15*				
	Harrison, N. J.													15.05 *C11*
	Conshohocken, Pa.		$101.00 *A2*	$121.00 *A2*					4.975 *A2*	7.20 *A2*	7.325 *A2*			
	New Bedford, Mass.									7.60 *R6*				
	Johnstown, Pa.	$77.50 *B3*	$96.00 *B3*	$114.00 *B3*		5.325 *B3*	7.80 *B3*							
	Boston, Mass.									7.70 *T8*				15.40 *T8*
	New Haven, Conn.									7.60 *D1*				
	Baltimore, Md.									7.15 *T8*				
	Phoenixville, Pa.					5.50 *P2*		5.50 *P2*						
	Sparrows Pt., Md.								4.925 *B3*		7.325 *B3*			
	Bridgeport, Wallingford, Conn.	$80.50 *N8*	$101.00 *N8*	$114.00 *N8*						7.60 *W1*				
	Pawtucket, R. I. Worcester, Mass.									7.70 *N7* 7.70 *A5*				15.40 *N7* 15.20 *T8*
MIDDLE WEST	Alton, Ill.								5.125 *L1*					
	Ashland, Ky.								4.925 *A7*					
	Canton-Massillon, Dover, Ohio		$96.00 *R3*	$114.00 *R3, T5*						7.15 *G4*		10.45 *G4*		14.85 *C11*
	Chicago, Ill. Franklin Park, Ill. Evanston, Ill.	$77.50 *U1, R3*	$96.00 *U1, R3,W8*	$114.00 *U1, R3,W8*	6.225 *U1*	5.275 *U1, W8,P13*	7.75 *U1,Y1 W8*	5.275 *U1*	4.925 *W8, N4,A1*	7.25 *A1,T8 M8*			8.10 *W8, S9,I3*	15.05 *A1, S9,G4*
	Cleveland, Ohio									7.15 *A5,J3*		10.45 *A5*	8.10 *J3*	
	Detroit, Mich.			$114.00 *R3*					5.025 *G3, M2*	7.25 *M2,D1, D2,G3,P11*	7.425 *G3*	10.60 *D2* 10.55 *G3*	8.10 *G3*	
	Anderson, Ind.									7.15 *G4*				
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$77.50 *U1*	$96.00 *U1*	$114.00 *U1, Y1*		5.275 *U1, I3*	7.75 *U1, I3*	5.525 *I3*	4.925 *U1, I3,Y1*	7.15 *Y1*	7.325 *U1, I3,Y1*	10.60 *Y1*	8.10 *U1, Y1*	
	Sterling, Ill.	$77.50 *N4*				5.275 *N4*			5.025 *N4*					
	Indianapolis, Ind.									7.30 *J3*				15.20 *J3*
	Newport, Ky.												8.10 *A9*	
	Middletown, Ohio													
	Niles, Warren, Ohio Sharon, Pa.		$96.00 *S1, C10*	$114.00 *C10,S1*					4.925 *R3, S1*	7.15 *R3,T4 S1*	7.325 *R3, S1*	10.50 *S1* 10.45 *R3*	8.10 *S1*	15.05 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Aliquippa, Pa.	$77.50 *U1, P6*	$96.00 *U1, C11,P6*	$114.00 *U1, C11,B7*	6.225 *U1*	5.275 *U1, J3*	7.75 *U1, J3*	5.275 *U1*	4.925 *P6*	7.15 *J3,B4, S7*			8.10 *S9*	15.05 *S9*
	Weirton, Wheeling, Follansbee, W. Va.					5.275 *W3*			4.925 *W3*	7.15 *W3,F3*	7.325 *W3*	10.50 *W3*		
	Youngstown, Ohio	$77.50 *R3*	$96.00 *Y1, C10*	$114.00 *Y1*			7.75 *Y1*			7.15 *Y1,J3*	7.325 *U1, Y1*	10.65 *Y1*	8.10 *U1, Y1*	15.05 *J3* 10.65 *Y1*
WEST	Fontana, Cal.	$88.00 *K1*	$105.50 *K1*	$135.00 *K1*		6.075 *K1*	8.55 *K1*	6.225 *K1*	5.825 *K1*	9.00 *K1*				
	Geneva, Utah		$96.00 *C7*			5.275 *C7*	7.75 *C7*							
	Kansas City, Mo.					5.375 *S2*	7.85 *S2*						8.35 *S2*	
	Los Angeles, Torrance, Cal.		$105.50 *B2*	$134.00 *B2*		5.975 *C7, B2*	8.45 *B2*		5.675 *C7, B2*	9.05 *J3*			9.30 *B2*	17.25 *J3*
	Minnequa, Colo.					5.575 *C6*			6.025 *C6*	9.10 *K1*				
	Portland, Ore.					6.025 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$105.50 *B2*			5.925 *B2*	8.40 *B2*		5.675 *C7, B2*					
	Seattle, Wash.		$109.50 *B2*			6.025 *B2*	8.50 *B2*		5.925 *B2*					
SOUTH	Atlanta, Ga.					5.475 *A8*			5.125 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$77.50 *T2*	$96.00 *T2*			5.275 *T2, R3,C16*	7.75 *T2*		4.925 *T2, R3,C16*		7.325 *T2*			
	Houston, Lone Star, Texas		$101.00 *S2*	$119.00 *S2*		5.375 *S2*	7.85 *S2*						8.35 *S2*	

(Effective Sept. 23, 1957)

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STEEL PRICES

		SHEETS								WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* *1.25* lb. base box	Electro* *0.25* lb. base box	Hollowware Enameling *29* ga.
EAST	Bethlehem, Pa.												
	Buffalo, N. Y.	4.925 *B3*	6.05 *B3*				7.275 *B3*	8.975 *B3*		6.15 *W6*			
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	4.975 *A2*	6.10 *A2*				7.325 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.15 *B3*			
	Fairless, Pa.	4.975 *U1*	6.10 *U1*				7.325 *U1*	9.025 *U1*			$10.15 *U1*	$8.85 *U1*	
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	4.925 *B3*	6.05 *B3*	6.60 *B3*			7.275 *B3*	8.975 *B3*	9.725 *B3*	6.25 *B3*	$10.15 *B3*	$8.85 *B3*	
	Worcester, Mass.									6.45 *A5*			
	Trenton, N. J.												
MIDDLE WEST	Alton, Ill.									6.35 *L1*			
	Ashland, Ky	4.925 *A7*		6.60 *A7*	6.625 *A7*								
	Canton-Massillon, Dover, Ohio			6.60 *R3, R1*									
	Chicago, Joliet, Ill.	4.925 *W8, A1*					7.275 *U1*			6.15 *A5, R3,W8, N4, K2*			
	Sterling, Ill.									6.25 *N4, K2*			
	Cleveland, Ohio	4.925 *R3, J3*	6.05 *R3, J3*		6.625 *R3*		7.275 *R3, J3*	8.975 *R3, J3*		6.15 *A5*			
	Detroit, Mich.	5.025 *G3, M2*	6.15 *G3* 6.05 *M2*				7.375 *G3*	9.075 *G3*					
	Newport, Ky	4.925 *A1*	6.05 *A1*										
	Gary, Ind. Harbor, Indiana	4.925 *U1, I3,Y1*	6.05 *U1, I3,Y1*	6.60 *U1, I3*	6.625 *U1, I3,Y1*	7.00 *U1*	7.275 *U1, Y1,I3*	8.975 *U1, Y1*		6.15 *Y1*	$10.05 *U1, Y1*	$8.75 *I3, U1,Y1*	7.50 *U1, Y1*
	Granite City, Ill.	5.125 *G2*	6.25 *G2*	6.80 *G2*	6.825 *G2*							$8.85 *G2*	7.60 *G2*
	Kokomo, Ind.			6.70 *C9*						6.25 *C9*			
	Mansfield, Ohio		6.05 *E2*			7.00 *E2*							
	Middletown, Ohio		6.05 *A7*	6.60 *A7*	6.625 *A7*	7.00 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	4.925 *R3, N3,S1*	6.05 *R3*	6.60 *R3*	6.625 *N3, S1*	7.00 *N3, S1,R3*	7.275 *R3*	8.975 *S1, R3*				$8.75 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Donora, Pa. Aliquippa, Pa.	4.925 *U1, J3,P6*	6.05 *U1, J3,P6*	6.60 *U1, J3*	6.625 *U1*		7.275 *U1, J3*	8.975 *U1, J3*	9.725 *U1*	6.15 *A5, J3,P6*	$10.05 *U1, J3*	$8.75 *U1, J3*	7.50 *U1, J3*
	Portsmouth, Ohio	4.925 *P7*	6.05 *P7*							6.15 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.925 *W3, W5*	6.05 *W3, F3,W5*	6.60 *W3, W5*		7.00 *W3, W5*	7.275 *W3*	8.975 *W3*			$10.05 *W3, W5*	$8.75 *W3, W5*	7.50 *W5*
	Youngstown, Ohio	4.925 *U1, Y1*	6.05 *Y1*		6.625 *Y1*		7.275 *Y1*	8.975 *Y1*		6.15 *Y1*			
WEST	Fontana Cal.	5.825 *K1*	7.30 *K1*				8.175 *K1*	10.275 *K1*			$10.80 *K1*	$9.50 *K1*	
	Geneva, Utah	5.025 *C7*											
	Kansas City, Mo.									6.40 *S2*			
	Los Angeles, Torrance, Cal.									6.95 *B2*			
	Minnequa, Colo.									6.40 *C6*			
	San Francisco, Niles, Pittsburgh, Cal.	5.625 *C7*	7.00 *C7*	7.35 *C7*						6.95 *C7*	$10.80 *C7*	$9.50 *C7*	
	Seattle, Wash.												
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	4.925 *T2, R3*	6.05 *T2, R3*	6.60 *T2, R3*						6.15 *T2, R3*	$10.15 *T2*	$8.85 *T2*	
	Houston, Tex.									6.40 *S2*			

† Special coated mfg. terne deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box.

* COKES: 1.50-lb. add 25¢.
ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb. 0.25 lb. add 65¢.

(Effective Sept. 23, 1957)

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STEEL PRICES

		BARS						PLATES			WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfrs'. Bright
EAST	Bethlehem, Pa.				6.475 *B3*	8.775 *B3*	7.925 *B3*					
	Buffalo, N. Y.	5.425 *B3,B5*	5.425 *B3,B5*	7.35 *B5*	6.475 *B3,B5*	8.775 *B3,B5*	7.925 *B3*	5.10 *B3*		7.20 *B2*	7.625 *B2*	7.65 *W6*
	Claymont, Del.							5.70 *P2*		7.20 *C4*	7.625 *C4*	
	Coatesville, Pa.							5.50 *L4*		7.20 *L4*	7.925 *L4*	
	Conshohocken, Pa.							5.20 *A2*	6.175 *A2*	7.20 *A2*	7.625 *A2*	
	Harrisburg, Pa.							5.80 *P2*	6.275 *P2*			
	Milton, Pa.	5.575 *M7*	5.575 *M7*									
	Hartford, Conn.			7.80 *R3*		9.075 *R3*	7.925 *B3*					
	Johnstown, Pa.	5.425 *B3*	5.425 *B3*		6.475 *B3*			5.10 *B3*		7.20 *B3*	7.625 *B3*	7.65 *B3*
	Fairless, Pa.	5.575 *U1*	5.575 *U1*		6.625 *U1*							
	Newark, N. J. Camden, N. J.			7.75 *W10* 7.75 *P10*		8.95 *W10* 8.95 *P10*						
	Bridgeport, Conn. Putnam, Conn. Willimantic, Conn.	5.65 *N8*	5.65 *N8*	7.65 *N8* 7.85 *W10* 7.80 *J3*	6.55 *N8*	8.925 *N8*						
	Sparrows Pt., Md.		5.425 *B3*					5.10 *B3*		7.20 *B3*	7.625 *B3*	7.75 *B3*
	Palmer, Worcester, Readville, Mass. Mansfield, Mass.			7.85 *B3,C14*		9.075 *A5,B5*						7.95 *A5, W6*
	Spring City, Pa.			7.75 *K4*		8.95 *K4*						
MIDDLE WEST	Alton, Ill.	5.625 *L1*										7.85 *L1*
	Ashland, Newport, Ky.							5.10 *A7,A1*		7.20 *A1*		
	Canton, Massillon, Ohio			7.30 *R3,R2*	6.475 *R3,T5*	8.775 *R3,R2, T5*						
	Chicago, Joliet, Waukegan, Ill. Harvey, Ill.	5.425 *U1,R3, W8,N4,P13*	5.425 *U1,R3, N4,P13*	7.30 *A5, W10,W8 B5,L2,N9*	6.475 *U1,R3, W8*	8.775 *A5, W10,W8 L2,N8,B5*	7.925 *U1,W8*	5.10 *U1,A1, W8,I3*	6.175 *U1*	7.20 *U1,W8*	7.625 *U1,W8*	7.65 *A5,R3, W8,N4, K2,W7*
	Cleveland, Ohio	5.425 *R3*	5.425 *R3*	7.30 *A5,C13*		8.775 *A5, C13*	7.925 *R3*	5.20 *R3,J3*	6.175 *J3*		7.625 *R3, J3*	7.65 *A5, C13*
	Detroit, Mich.	5.525 *G3*	5.775 *G3*	7.30 *J3* 7.50 *P8,B5*	6.475 *J3* 6.575 *G3*	8.775 *R3* 8.975 *B5,P3, P8*	8.025 *G3*	5.20 *G3*		7.35 *G3*		
	Duluth, Minn.											7.65 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.425 *U1,I3, Y1*	5.425 *U1,I3, Y1*	7.30 *R3,J3*	6.475 *U1,I3, Y1*	8.775 *R3,M4*	7.925 *U1, Y1*	5.10 *U1,I3, Y1*	6.175 *J3,I3*	7.20 *U1,Y1*	7.625 *U1, Y1,I3*	7.75 *M4*
	Granite City, Ill.							5.30 *G2*				
	Kokomo, Ind.											7.75 *C9*
	Sterling, Ill.	5.525 *N4*	5.525 *N4*					5.10 *N4*				7.75 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.30 *C10*	6.475 *C10,S1*	8.775 *C10*	7.925 *S1*	5.10 *R3,S1*		7.20 *S1*	7.625 *R3, S1*	
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.425 *U1,J3*	5.425 *U1,J3*	7.30 *A5,B4, R3,J3,C11, W10,S9,C8*	6.475 *U1,J3, C11,B7*	8.775 *A5, W10,R3,S9, C11,C8*	7.925 *U1,J3*	5.10 *U1,J3*	6.175 *U1*	7.20 *U1,J3, B7*	7.625 *U1,J3, B7*	7.65 *A5, J3,P6*
	Portsmouth, Ohio											7.65 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.10 *W5*				
	Youngstown, Ohio	5.425 *U1,R3, Y1*	5.425 *U1,R3, Y1*	7.30 *A5,Y1, F2*	6.475 *U1,Y1*	8.775 *Y1,F2*	7.925 *U1,Y1*	5.10 *U1,R3, Y1*		7.20 *Y1*	7.625 *U1, R3,Y1*	7.65 *Y1*
WEST	Emeryville, Cal.	6.175 *J3*	6.175 *J3*									
	Fontana, Cal.	6.125 *K1*	6.125 *K1*		7.525 *K1*		8.625 *K1*	5.90 *K1*		8.00 *K1*	8.425 *K1*	
	Geneva, Utah							5.10 *C7*			7.625 *C7*	
	Kansas City, Mo.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*					7.90 *S2*
	Los Angeles, Torrance, Cal.	6.125 *C7,B2*	6.125 *C7,B2*	8.75 *R3,P14*	7.525 *B2*	10.65 *P14*	8.625 *B2*					8.60 *B2*
	Minnequa, Colo.	5.875 *C6*	5.875 *C6*					5.95 *C6*				7.90 *C6*
	Portland, Ore.	6.175 *O2*	6.175 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.125 *C7* 6.175 *B2*	6.125 *C7* 6.175 *B2*				8.675 *B2*					8.60 *C7,C6*
	Seattle, Wash.	6.175 *B2,N6*	6.175 *B2*				8.675 *B2*	6.00 *B2*		8.10 *B2*	8.525 *B2*	
SOUTH	Atlanta, Ga.	5.625 *A8*	5.625 *A8*									7.85 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	5.425 *T2,R3, C16*	5.425 *T2,R3, C16,S11*	7.90 *C16*			7.925 *T2*	5.10 *T2,R3*			7.625 *T2*	7.65 *T2,R3*
	Houston, Ft. Worth, Lone Star, Tex.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*	5.20 *S2* 5.45 *L3*		7.30 *S2*	7.725 *S2*	7.90 *S2*

† Merchant Quality. Special Quality 35c higher.

(Effective Sept. 23, 1957)

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.

D1 Detroit Steel Corp., Detroit
D2 Dearborn Div., Sharon Steel Corp.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Northeastern Steel Corp., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts net f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½ to 3 In.		2 In.		2½ In.		3 In.		3½ to 4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Youngstown *R3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Fontana *K1*	+8.25	+23.5	+5.25	+19.5	+1.75	+15.00	0.75	+14.25	1.25	+13.25	1.75	+12.75	3.25	+13.00								
Pittsburgh *J3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Alton, Ill. *L1*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Sharon *M3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Fairless *N2*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Pittsburgh *N3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Wheeling *W5*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Wheatland *W4*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Youngstown *Y1*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Indiana Harbor *Y1*	4.25	+11.0	7.25	+7.0	10.75	+2.50	13.25	+1.75	13.25	+0.75	14.25	+0.25	15.75	+1.00								
Lorain *N2*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Youngstown *R3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Fairless *N2*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Fontana *K1*	+3.75		0.25		3.25		3.75		4.25		4.75		5.25									
Pittsburgh *J3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Alton, Ill. *L1*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Sharon *M3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Pittsburgh *N3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Wheeling *W5*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Wheatland *W4*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Youngstown *Y1*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Indiana Harbor *Y1*	8.75	+5.0	12.75	+1.0	15.75	3.50	16.25	2.25	16.75	3.25	17.25	3.75	17.75	2.50								
Lorain *N2*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50

Threads only, buttweld and seamless 2½ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9c to 11c per lb. East St. Louis. For each 2c change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1 pt.; 2½ and 3-in., 1 pt., e.g. zinc price range of over 13c to 15c would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7c to 9c would increase discounts. East St. Louis zinc price now 10c per lb.

(Effective Sept. 23, 1957)

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1			$1.68	T-1
18	4	1		5	2.385	T-4
18	4	2			1.185	T-2
15	4	1.5	8		1.04	M-1
6	4	3	6		1.42	M-3
6	4	2	5		1.185	M-2

High-carbon chromium ..... .82 D-3, D-5
Oil-hardened manganese ..... .55 O-2
Special carbon ..... .41 W-1
Extra carbon ..... .345 W-1
Regular carbon ..... .29 W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

Stainless Type	Cladding	Plate (*A5, J2, L4*) 10 pct	Plate (*A5, J2, L4*) 15 pct	Plate (*A5, J2, L4*) 20 pct	Sheet (*I2*) 20 pct
	302				37.50
	304	37.95	42.25	46.70	46.00
	316	44.40	49.50	54.50	58.75
	321	40.05	44.60	49.30	47.25
	347	42.40	47.55	52.80	57.00
	405	29.85	33.35	36.85	
	410	29.55	33.10	36.70	
	430	29.80	33.55	37.25	

CR Strip (*S9*) Copper, 10 pct, 2 sides, 40.25; 1 side, 33.95.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.525	6.50	6.975				
Cleveland *R5*							14.75
So. Chicago *R5*				9.75			
Ensley *T2*	5.525	6.50					
Fairfield *T2*		6.50		9.75		6.60	
Gary *U1*	5.525					6.60	
Huntington *C6*		6.50					
Ind Harbor *I5*	5.525		6.975	9.75		6.60	
Ind Harbor *V1*				9.75			
Johnstown *B5*		6.50					
Joliet *U1*			6.975				
Kansas City *S2*				9.75			14.75
Lackawanna *B5*	5.525	6.50	6.975			6.60	
Lebanon *B5*			6.975		14.50		14.75
Minnequa *C6*	5.525	7.00	6.975	9.75		6.60	14.75
Pittsburgh *P5*							14.75
Pittsburgh *J5*				9.75			
Seattle *B2*				10.25		6.75	15.75
Steelton *B5*	5.525		6.975			6.60	
Struthers *Y1*				9.75			
Torrance *C7*						6.75	
Williamsport *S5*		6.50					
Youngstown *R5*				9.75			

COKE

	Net-Ton
Furnace, beehive (f.o.b.) Connellsville, Pa.	$15.00 to $15.75
Foundry, beehive (f.o.b.)	$17.50 to $19.00
Foundry oven coke	
Buffalo, del'd	$31.75
Detroit, f.o.b.	30.50
New England, del'd	31.55
Kearney, N. J., f.o.b.	29.75
Philadelphia, f.o.b.	29.50
Swedeland, Pa., f.o.b.	29.50
Painesville, Ohio, f.o.b.	30.50
Erie, Pa., f.o.b.	30.50
Cleveland, del'd	32.65
Cincinnati, del'd	31.84
St. Paul, f.o.b.	29.75
St. Louis, f.o.b.	31.50
Birmingham, f.o.b.	28.85
Milwaukee, f.o.b.	30.50
Neville Is., Pa.	29.25

LAKE SUPERIOR ORES

(Lump, Fe natural content, delivered lower Lake ports. Prices for 1957 season. Freight charges for seller's account. Gross Ton

Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

ELECTRICAL SHEETS

22-Gage	Hot-Rolled	Cold-Reduced (Coiled or Cut Length)	
F.o.b. Mill Cents Per Lb	Cut Lengths	Semi-Processed	Fully Processed
Field		9.625	
Armature	11.10	10.85	11.35
Elect.	11.80	11.55	12.05
Hermetic		12.10	
Motor	12.90	12.65	13.15
Dynamo	13.95	13.70	14.20
Trans. 72	15.00	14.75	15.25
Trans. 65	15.55		
		Grain Oriented	
Trans. 58	16.05	Trans. 80	19.20
Trans. 52	17.10	Trans. 73	19.70

Producing points: Beech Bottom (*W8*); Brackenridge (*A5*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*N5*); Niles, O. (*N8*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

ELECTRODES

Cents per lb, f.o.b. plant, threaded, with nipples, unbored.

GRAPHITE Diam. (In.)	Length (In.)	Price	CARBON* Diam. (In.)	Length (In.)	Price
24	84	24.75	40	100, 110	10.70
20	72	24.00	35	110	10.70
16 to 18	72	24.50	30	110	10.85
14	72	25.00	24	72 to 84	11.25
12	72	25.50	20	90	11.00
10	60	26.50	17	72	11.40
10	48	27.00	14	72	11.85
7	60	26.75	12	60	12.95
6	60	30.00	10	60	13.00
4	40	33.25	8	60	13.30
3	40	35.25			
2½	30	37.25			
2	24	57.75			

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)	$135.00
No. 1 Ohio	120.00
Sec. Quality, Pa., Md., Ky., Mo., Ill.	120.00
No. 2 Ohio	102.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $2.00)	21.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$150.00
Childs, Hays, Pa.	155.00
Chicago District	160.00
Western Utah	175.00
California	180.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	157.00-160.00
Silica cement, net ton, bulk, Latrobe	28.50
Silica cement, net ton, bulk, Chicago	25.50
Silica cement, net ton, bulk, Ensley, Ala.	26.50
Silica cement, net ton, bulk, Mt. Union	24.50
Silica cement, net ton, bulk, Utah and Calif.	37.00

Chrome Brick *Per net ton*

Standard chemically bonded, Balt.	$105.00
Standard chemically bonded, Curtiner, Calif.	115.00
Burned, Balt.	99.00

Magnesite Brick

Standard, Baltimore	$131.00
Chemically bonded, Baltimore	116.00

Grain Magnesite St. ⅜ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk	$73.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk	46.00
in sacks	52.00-54.00

Dead Burned Dolomite *Per net ton*

F.o.b. bulk, producing points in: Pa., W. Va., Ohio	$16.75
Midwest	17.00
Missouri Valley	15.00

(Effective Sept. 23, 1957)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Annld ¢ lb.	Merch. Wire Galv. ¢ lb.
Alabama City *R3*	173	187		212	193	8.65	9.20
Aliquippa *J5***	173	190			190	8.65	9.325
Atlanta *A8***	175			208	199	8.50	9.10
Bartonville *K2***	175	192	178	214	198	8.75	9.425**
Buffalo *W6*						8.65	8.95*
Chicago *N4****							
Cleveland *A6*							
Cleveland *A5*						8.65	
Crawf'dsv. *M4***	175	192		214	198	8.75	9.425
Donora, Pa. *A5*	173	187		212	193	8.65	9.20
Duluth *A5*	173	187		212	193	8.65	9.20
Fairfield, Ala. *T2*	173	187		212	193	8.65	9.20
Galveston *D4*	8.95‡						
Houston *S2*	178	192		217	198	8.90	9.45
Jacksonville *M4*	184	197		219	203	9.00	9.675
Johnstown *B5***	173	190	172		196**	8.65	9.325**
Joliet, Ill. *A5*	173	187		212	193	8.65	9.20
Kokomo *C9**	175	189		214	195*	8.75	9.30*
L. Angeles *B2****						9.60	10.275
Kansas City *S2**	178	192		217	198*	8.90	9.45*
Minnequa *C6*	178	192	177	217	198‡	8.90	9.45‡
Monessen *P6*					193	8.65	9.20
Palmer, Mass. *W6*						8.95	9.50*
Pittsburg, Cal. *C7*	192	210			213	9.60	10.15
Rankin, Pa. *A5*	173	187			193	8.65	9.20
So. Chicago *R3*	173	187			193	8.65	9.20
S. San Fran. *C6‡*				236		9.60	10.15‡
SparrowsPt *B4***	175			214	198	8.75	9.425
Struthers, O. *Y1**						8.65	9.30
Worcester *A5*	179					8.95	9.50
Williamsport *S5*							

* Zinc less than .10¢.
** 11-12¢ zinc.
*** 10¢ zinc.
† Plus zinc extras.
‡ Wholesalers only.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26 0.40	0.41 0.60	0.61 0.80	0.81 1.05	1.06 1.35
Baltimore, Md. *T8*	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. *W12*		10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70		
Detroit *D1*	9.05	10.50	12.70	15.70	
Detroit *D2*	9.05	10.50	12.70		
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60		
Franklin Park, Ill. *T8*	9.05	10.25	12.45	15.45	18.40
Harrison, N. J. *C11*			12.90	16.10	19.30
Indianapolis *J3*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Pittsburgh *S7*	8.95	10.40	12.60	15.60	18.55
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*		10.70	12.90	16.10	19.30
Wallingford *W1*	9.40	10.70	12.90	15.90	18.55
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *J5*	8.95	10.40	12.60	15.60	18.55

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
National Tube	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
Pittsburgh Steel	2	13	36.34	42.56	
	2½	12	48.94	57.31	
	3	12	56.51	66.18	
	3½	11	65.97	77.25	
	4	10	87.61	102.59	

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Pct. Discounts

Machine and Carriage Bolts	Full Container Price	30 Containers	20,000 Lb.	40,000 Lb.
½" and smaller x 6" and shorter	49	54	56	57
⅝" thru 1" x longer than 6"	35	40	43	45
Rolled thread carriage bolts ½" & smaller x 6" and shorter	49	54	56	57
Lag, all diam. x 6" & shorter	49	54	56	57
Lag, all diam. longer than 6 in.	39	44½	47	48½
Plow bolts, ½" and smaller x 6" and shorter	49	54	56	57

(Add 25 pct for broken case quantities)

Nuts, Hex, HP reg. & hvy.	Full case or Keg price
¾ in. or smaller	60½
⅞ in. to 1 in. inclusive	55½
1⅛ in. to 1½ in. inclusive	58½
1⅝ in. and larger	53½
C. P. Hex, reg. & hvy.	
¾ in. and smaller	60½
⅞ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½
Hot Galv. Hex Nuts (All Types)	
¾ in. and smaller	46½
Semi-finished Hex Nuts	
⅝ in. or smaller	60½
¾ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½
(Add 25 pct for broken case or keg quantities)	
Finished	
⅞ in. and smaller	63
Rivets	*Base per 100 lb*
½ in. and larger	$12.25
	Pct. Off List
7/16 in. and smaller	19

Cap Screws

	Discount (Packages)	*Full Finished H. C. Heat Treat*
New std. hex head, packaged		
⅝" diam. and smaller x 6" and shorter	40	26
¾", ⅞", and 1" diam. x 6" and shorter	22	3
⅝" diam. and smaller x longer than 6"	8	+13
¾", ⅞", and 1" diam. x longer than 6"	+ 6	+32
		C-1018 Steel Full-Finished Cartons Bulk
¼" through ⅝" dia. x 6" and shorter	58	49
¾" through 1" dia. x 6" and shorter	45	33

Minimum quantity—¼" through ⅜" diam., 15,000 pieces; 7/16" through ⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

Plain Finish	Discount Mach. Screws	Stove Bolts
Cartons	19	32
Bulk — *Quantity*		
To ¼" diam. incl. — 25,000-200,000	9	54
5/16 to ½" diam. incl. — 25,000-200,000	9	54
All diam. over 3" long — 5,000-100,000	—	54

Machine Screws & Stove Bolt Nuts

	Discount Hex	Square
In Cartons	16	19
Quantity		
In Bulk		
⅝" diam. & smaller — 15,000-100,000	7	9

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.5
Chicago	140.9
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Rolled elliptical, 18 in. or longer, 5000 lb lots	45.00
Electrodeposited	36.25
Brass, 80-20, ball anodes, 2000 lb or more	44.00
Zinc, ball anodes, 2000 lb lots	17.50
(for elliptical add 1¢ per lb)	
Nickel, 99 pct plus, rolled carbon, 5000 lb	102.25
(Rolled depolarized add 3¢ per lb)	
Cadmium	1.70
Tin, ball anodes and elliptical $1.13 per lb.	

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	73.20
Copper sulphate, 100 lb bags, per cwt.	24.35
Nickel salts, single, 100 lb bags	40.50
Nickel chloride, freight allowed, 300 lb	45.50
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	23.05
(Philadelphia price 23.30)	
Zinc cyanide, 100 lb	59.00
Potassium cyanide, 100 lb drum N. Y.	48.00
Chromic acid, flake type, 10,000 lb or more	31.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh

Swedish sponge iron, del. East of Miss. River, ocean bags, 23,000 lb. and over	10.5¢
F.O.B. Riverton or Camden, New Jersey, West of Miss. River	9.5¢
Domestic sponge iron, 98+% Fe, 23,000 lb. and over del'd East of Miss. River	10.5¢
F.O.B. Riverton, New Jersey, West of Miss. River	9.5¢
Canadian sponge iron, del'd in East, carloads	9.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe	57.0¢
Electrolytic iron melting stock, 99.84% pure	22.0¢
Carbonyl iron size 3 to 20 micron, 98%, 99.8+% Fe	.88.0¢ to $2.90
Aluminum, freight allowed	38.00¢
Brass, 10 ton lots	.37.4¢ to 41.5¢
Copper electrolytic	45.75¢
Copper, reduced	19.75¢
Cadmium, 100-199 lb. 95¢ plus metal value	
Chromium, electrolytic, 99.85% min. Fe, 03 max. Del'd	$5.00
Lead	.8.90¢ plus metal value
Manganese f.o.b. Extron, Pa.	46.0¢
Molybdenum, 99%	.$3.60 to $3.95
Nickel, chemically precipitated	$1.05
Nickel, unannealed	$1.00
Nickel, annealed	$1.06
Nickel, spherical, unannealed #80	$1.13
Silicon	43.50¢
Solder powder, 7.0¢ to 9.0¢ plus met. value	
Stainless steel, 302	$1.02
Stainless steel, 316	$1.20
Tin	.14.00¢ plus metal value
Tungsten, 99% (65 mesh) $3.75 (nominal)	
Zinc, 10 ton lots	.18.5¢ to 31.7¢

WAREHOUSES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery† Charge	Sheets: Hot-Rolled (18 ga. & hvr.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta	.....	8.59	9.87	10.13	8.64	8.97	9.05	9.01	10.68			.....	.....
Baltimore	$.10	8.38	8.88	9.86	8.86	8.76	9.29	9.16	11.44*	16.18	15.18	19.73	18.98
Birmingham	.15	8.18	9.45	10.15	8.23	8.56	8.64	8.60	10.57			.....	.....
Boston	.10	9.48	10.54	11.55	9.52	9.82	9.73	9.53	12.93*	15.79	15.38	19.89	19.18
Buffalo	.15	8.40	9.60	11.22	8.65	9.05	8.65	8.95	11.05*	16.34	15.15	19.01	18.95
Chicago	.15	8.35	9.60	10.15	8.38	8.71	8.79	8.75	8.95	15.80	14.65	19.35	18.40
Cincinnati	.15	8.49	9.65	10.20	8.69	9.08	9.33	9.07	9.46	15.61	15.11	18.96	18.91
Cleveland	.15	8.33	9.60	10.10	8.48	8.94	9.16	8.84	10.95*	15.89	14.74	19.44	18.54
Denver	.20	9.70	11.30	12.49	9.80	9.70	9.80	9.98	10.65			.....	17.60
Detroit	.15	8.58	9.85	10.50	8.73	9.06	9.33	9.05	9.30	15.46	15.06	18.81	18.86
Houston	.....	8.45	9.75		8.60	9.05	9.10	9.05	11.10	16.20		19.30	19.05
Kansas City	.20	9.02	10.27	10.07	9.05	9.38	9.46	9.42	9.87	20.02	15.47	20.02	19.27
Los Angeles	.10	9.60	10.85	11.75	9.65	9.65	9.70	9.80	12.85	17.25	15.00	21.05	19.25
Memphis	.15	8.02	9.22		8.12	8.35	8.39	8.25	9.85	.....		.....	.....
Milwaukee	.15	8.48	9.73	10.28	8.51	8.84	9.00	8.88	9.18	15.43	14.93	18.78	18.73
New York	.10	8.97	10.23	10.66	9.42	9.53	9.45	9.67	12.86*	15.02	15.19	18.42	18.99
Norfolk	.20	8.00			8.40	8.35	8.70	8.45	10.70			.....	.....
Philadelphia	.10	8.10	9.00	9.97	8.79	8.87	8.60	8.75	11.61*	15.61	15.11	18.96	18.91
Pittsburgh	.15	8.33	9.60	10.50	8.48	8.71	8.79	8.75	10.95*	15.80	14.80	19.35	18.60
Portland	.....	9.50	11.20	11.55	11.35	8.30‡	9.65	9.65	14.65	18.50	16.10	20.75	20.25
San Francisco	.10	9.45	10.85	11.10	11.05	9.70	9.60	9.80	13.10	17.05	16.10	21.05	20.35
Seattle	.....	9.95	11.15	12.00	10.00	9.70	9.80	10.10	14.05	16.55	15.85	20.65	19.45
Spokane	.15	10.10	11.30	12.15	10.15	9.85	9.95	10.25	14.20		17.25	21.55	21.05
St. Louis	.15	8.69	9.94	10.51	8.74	9.08	9.25	9.12	9.56	15.66	15.01	19.01	18.81
St. Paul	.15	8.94	10.19	10.76	8.99	9.45	9.53	9.37	9.81		15.26		19.06

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 1999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other or with galvanized sheets for quantity.

†† 10¢ zinc. ‡ Deduct for country delivery. ‡ 3/16 in. to ½ in. * C1018—1 in. rounds.

(Effective Sept. 23, 1957)

FERROALLOY PRICES

(Effective Sept. 24, 1957)

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .50-1.00% max. Si

0.02% C	11.50	0.20% C	28.50
0.03% C	11.90	0.50% C	28.25
0.06% C	28.50	1.00% C	27.50
0.10% C	29.00	1.50% C	27.35
0.15% C	28.75	2.00% C	27.25

4.00-4.50% C, 67.70% Cr, 1-2% Si ... 27.75
2.50-3.00% C, 57-64% Cr, 2.00-4.50% Si ... 26.50
0.02% C (Simplex) ... 26.75
0.10% C, 50-55% Cr, 2% max Si ... 27.75
8.00% max C, 50-55% Cr, 3-6% Si ... 24.00
8.00% C, 50-55% Cr, 3% max. Si ... 24.00

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5c per lb to regular low carbon ferrochrome (max. 0.10% C) price schedule. Add 5c for each additional 0.25% of N.

Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe

0.10% max. C	$1.31
0.50% max. C	1.31
2 to 11% C, 88-91% Cr, 0.75% Fe	1.30

Electrolytic Chromium Metal

Per lb of metal 2" x 1" plate (⅜" thick) delivered packed, 99.80% min. Cr (Metallic Basis) Fe 0.20 max.

Carloads	$1.29
Ton lots	1.31
Less ton lots	1.33

Low Carbon Ferrochrome Silicon

Cr 34-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 2-in. x down, per lb of Cr, packed

Carloads	14.65
Ton lots	18.35
Less ton lots	21.45

Calcium-Silicon

Per lb of alloy, lump, delivered, packed 30-35% Ca, 60-65% Si, 3.00 max. Fe

Carloads	25.65
Ton lots	27.95
Less ton lots	29.45

Calcium-Manganese—Silicon

Cents per lb of alloy, lump, delivered, packed

16-20% Ca, 14-18% Mn, 53-59% Si	
Carloads	24.25
Ton lots	26.15
Less ton lots	27.45

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x12 mesh

Ton lots	20.15
Less ton lots	21.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. 8% Lewis, V-5, 38-42% Cr, 17-19% Si, 8-11% Mn, packed

Carload lots	17.20
Ton lots	18.70
Less ton lots	19.95

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. 8% Lewis, Si 18 to 22%, Ti 9 to 11%, Cr 18 to 22%

Carload packed	18.50
Ton lots to carload packed	19.65
Less ton lots	20.90

Ferromanganese

Maximum base price, f.o.b. lump size, base content 74 to 76 pct Mn

Producing Point	Cents per lb
Marietta, Ashtabula, O., Alloy, W. Va., Sheffield, Ala., Portland, Ore.	12.25
Johnstown, Pa.	12.25
Sheridan, Pa.	12.25
Philo, Ohio	12.25
S. Duquesne	12.25

Add or subtract 0.1¢ for each 1 pct Mn above or below base content

Briquets, delivered, 66 pct Mn

Carloads, bulk	14.80
Ton lots packed	17.20

Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$100.50
19 to 21%	3% max.	102.50
21 to 23%	3% max.	105.00

Manganese Metal

2 in. x down, cents per pound of metal delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.75
Ton lots	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads	24.00
Ton lots	26.00
250 to 1999 lb	28.00
Premium for Hydrogen-removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn ... 25.50

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, del'd Mn 85-90%

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	37.15	39.95	43.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	33.60	36.40	37.60
0.20% max. C	32.10	34.90	36.10
0.50% max. C	31.60	34.40	35.60
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	28.60	31.40	32.60

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point

Carloads bulk	12.80
Ton lots, packed	14.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet	15.10
Ton lots, packed, pallets	16.50

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

	Ton lots, packed	Carloads, packed
96.75% Si, 1.25% Fe	22.20	20.90
98% Si, 0.75% Fe	22.95	21.65

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets

Carloads, bulk	7.70
Ton lots, packed	10.50

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point

50% Si	13.00	75% Si	16.40
65% Si	15.25	85% Si	18.10
	90% Si		19.50

Ferrovanadium

50-55% V delivered per pound, contained V, carloads, packed.

Openhearth	3.20
Crucible	3.30
High speed steel (Primos)	3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Alsiter, 20% Al, 40% Si, 40% Fe,

f.o.b. Suspension Bridge, N. Y., per lb.

Carloads	10.65¢
Ton lots	11.80¢

Calcium molybdate, 45.6-46.6%

f.o.b. Langeloth, Pa., per pound contained Mo ... $1.28

Ferrocolumbium, 50-50%, 2 in.

x D, delivered per pound contained Cb.

Ton lots	$4.90
Less ton lots	4.95

Ferro-tantalum-columbium, 20%

Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Sb plus Ta ... $4.25

Ferromolybdenum, 55-75%, 200-

lb containers, f.o.b. Langeloth, Pa., per pound contained Mo ... $1.68

Ferrophosphorus, electric, 23-

26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton ... $90.00
19 tons to less carload ... $110.00

Ferrotitanium, 40%, regular grade

0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti ... $1.35

Ferrotitanium, 25% low carbon,

0.10% C max. f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti

	$1.50
Less ton lots	1.54

Ferrotitanium, 15 to 18% high

carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton ... $240.00

Ferrotungsten, ¼ x down

packed, per pounds contained W, ton lots delivered ... $2.60 (nominal)

Molybdic oxide, briquets per lb

contained Mo, f.o.b. Langeloth, Pa.

5-lb cans or bags, f.o.b. Washington, Pa., Langeloth, Pa.	$1.41
	$1.33

Simanal, 20% Si, 20% Mn, 20%

Al, f.o.b. Philo, Ohio, freight allowed per lb

Carload, bulk lump	18.50¢
Ton lots, packed lump	20.50¢
Less ton lots	21.00¢

Vanadium oxide, 86-89% V_2O_5

per pound contained V_2O_5 ... $1.38

Zirconium, per lb of alloy

35-40%, f.o.b. freight allowed,

carloads, packed	27.25¢
12-15%, del'd lump, bulk-carloads	9.25¢

Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-43%, per lb contained B

2000 lb carload	$5.50

Bortram, f.o.b. Niagara Falls,

Ton lots per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.

Ton lots per pound	14.00¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C 1-in. x D, ton lots, f.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up

10 to 14% B	$1.20
14 to 19%	.85
19% min. B	1.20
	1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over

No. 1	$1.65
No. 75	50¢

Manganese-Boron, 75.00% Mn, 15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots	$1.46
Less ton lots	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots ... $2.15

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The few perforations illustrated are indicative of the wide variety of our line—we can *perforate almost any size perforation in any kind of metal or material required.* Send us your specifications.

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***Clark* HOLE-PRODUCING TOOLS**
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CLARK HOLE MILL—Makes fixed diameter holes fast! One pass in thick stock. Easy starts, curved or irregular surfaces. 1" to 4" sizes; others special.

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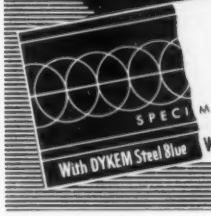

Popular package is 8-oz. can fitted with Bakelite cap holding soft-hair brush for applying right at bench; metal surface ready for layout in a few minutes. The dark blue background makes the scribed lines show up in sharp relief, prevents metal glare. Increases efficiency and accuracy.

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END NIGHT CLEANUP & MORNING REBLUING

DYKEM HI-SPOT BLUE No. 107 is used to locate high spots when scraping bearing surfaces. As it does not dry, it remains in condition on work indefinitely, saving scraper's time. Intensely blue, smooth paste spreads thin, transfers clearly. No grit; noninjurious to metal. Uniform. Available in collapsible tubes of three sizes. Order from your supplier. Write for free sample tube on company letterhead.

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OCTOBER 24

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THE CLEARING HOUSE

Detroit Market Is Marking Time

Used machinery business there, tied to automotive activity, is currently quiet.

Some reasons: late changeovers by the automakers, less contracting, tight money and defense cutbacks.

■ Sales continue to mark time in the Detroit area's used machinery business. Most dealers, however, feel that an upturn should come soon. They felt the same way two months ago.

The used tool business in the area depends heavily on the automobile industry. When smaller shops get contracts for new model car production they usually are in a mood to start looking for replacement equipment or additional equipment.

According to the used machinery dealers these buyers haven't made their presence felt in any substantial number to date. They give several reasons for this.

The Changeover Factor—Automobile manufacturers have taken a number of bids on jobs but haven't, as yet, let out the contracts. Consequently, many suppliers haven't nailed down their prospects for business during the coming model year and are reluctant to extend themselves until they receive some assurances.

Undoubtedly a related factor is the later changeovers this year by the auto makers. Ford and Mercury are scheduled to go down in the last week of the month—six weeks later than 1956. Chrysler has already gone down — four weeks later than last year.

Tight Money and Cutbacks — Tight money is another prime factor contributing to the generally depressed market picture. Even so, dealers say they are making marginal sales they wouldn't have considered a few years back. The majority of sales are on credit. Down payments have been smaller. Terms have taken on the look of auto town's cars—longer and lower.

Recent government cutbacks have also dulled the shiny outlook for some of the shops working on government contracts. They are now competing for automotive work.

"One customer recently inquired about a particular piece of equipment. After much checking around and finally locating it, I called him back. The customer said he had ordered a new machine because he could get delivery in two weeks," he said.

What's Moving—While business was far from good during the summer months, there was some business. Demand for heavy presses has been strong. This is also the case for toolroom lathes, radial drills and boring mills. Good standard lathes are even in short supply.

Currently there isn't a market for grinders and toolroom equipment, in general, has been spotty. Some dealers specializing in this line have found business holding at a fair level. Others have found the market dead.

The supply of late model equipment is good. Dealers say they have warehouses full of tools and machines in excellent condition, and prices are low.

CONSIDER GOOD USED EQUIPMENT FIRST

BENDING ROLLS
10' x 10" Ga. Bertsch Initial Type
10' x ½" Kling Pyramid Type—LATE
16' x ¾" Ransome, Pyramid Type
18' x 1" Niles Pyramid Type
BRAKES—LEAF TYPE
12' x ¼" Dreis & Krump
12' x ⅜" Dreis & Krump No. 228
BRAKE—PRESS TYPE
12' x ⅛" Cincinnati
CRANES—OVERHEAD ELECTRIC TRAVELING

3 ton P&H	56' Span 220/3/60
5 ton Cleveland	60' Span 115 Volt D.C.
8 ton P&H	55' Span 220/3/60
10 ton Shepard Niles	38' Span 440/3/60
10 ton Shaw	120' Span 230 Volt D.C.
15 ton Shepard Niles	52" Span 230 Volt D.C.
15 ton Shepard Niles	55' Span 220/440 A.C.
15 ton Niles	75' Span 220/3/60
15 ton P&H	55' Span 220/440 A.C.
120 ton Shepard Niles	77' Span 220/3/60

CUT OFF MACHINE
#2A Modern Automatic Cut Off Machine, For Pipe, Tubing, Bars to 2" O.D.
FORGING MACHINES
1" to 5" Acme, Ajax, National
HAMMERS—BOARD DROP—STEAM DROP—STEAM FORGING

800, 1600 lb. Chambersburg J-2	Board Drop
1200, 1500 lb. Chambersburg	Board Drop
2000 lb. Erie Type FV	Board Drop
2000 lb. Chambersburg Model E	Steam Drop
2000, 2500 lb. Erie	Steam Drop
3000 lb. Niles-Bement-Pond	Steam Drop
4000 lb. Chambersburg	Steam Drop
1100 lb. Erie Single Frame	Steam Forging
1500 lb. Chambersburg Sgle Fr	Steam Forging
20,000 lb. Massey Arch Frame	Steam Forging

LEVELLERS—ROLLER
48" Aetna 17 Rolls 3¾ dia.
66" Aetna 17 Rolls 4⅝" dia.
PLANER
72" x 72" x 16' Detrick & Harvey Four Head
PLANER—PLATE EDGE
35' Southwark, 16 Pneu. Jacks, Capy. 1½"
PRESSES—HYDRAULIC
500 ton HPM Fastraverse, Bed 36"x36"
1500 ton Bliss, 15" Stroke, Bed 49"x48"
1500 ton Mesta Steam Hydr. Forging Press
2000 ton Bliss 18" Stroke Bed Area 54"x55"
4500 Baldwin-Lima-Hamilton Hydr. Forging Press
PRESSES—STRAIGHT SIDE
100 ton Clearing F1100, 14" Str. Bed 36x36"
180 ton Hamilton #847, 12" Str. 85½" Bet. Ups.
200 ton Clearing F1200-42, Stroke 30", Bed 44"x38"
250 ton Bliss #88 12" Str. Bed 29"x29"
250 ton Bliss #81 7¾" Str. Bistr 33"x39"
PRESSES—KNUCKLE JOINT
600 ton Clearing K-1600-36, 4" stroke, Bed 36"x36"
1500 ton Verson, 4" Stroke, Bed 48x48", Architectural Jaw
PUNCH & SHEAR COMBINATIONS
Cleveland Style EF, Arch Jaw, Capy. 1¼"x1"
Cleveland Style G Single End, 60" Throat
Cleveland Style W, 60" Throat
No. 1½" Buffalo Universal Ironworker
ROLLING MILLS
6" x 5" Torrington Wire Flattening Mill Line
8" x 10" Schmitz Single Stand Two High
10" x 14" Single Stand Two High
10" x 16" Single Stand Two High
12" x 12" Single Stand Two High
12" x 16" Single Stand Two High
16" x 30" Farrel Two Stand Two High
20" x 36" Single Stand Two High
26" x 72" Cold Rolling Mill
ROLL—CORRUGATING
12' Stamco, Rolls 24" Dia. Corrugations 2.66"
ROLL—PLATE STRAIGHTENING
72" Niles, 7 Rolls 9" Dia. Motor Driven
SHEAR—ALLIGATOR
No. 4 Mesta RH LK. Capacity 2" x 12"
SHEAR—GATE
12" x ¼" Niagara Model 1212, NEW 1951
SHEAR LINES
36" x .020 Ga. Halliden Shear Line
60" x 7 Ga. Shear Line
96" x 14 Ga. Cleveland Shear Line
SHEARS—SQUARING
6' x 10 Ga. Niagara No. 672
8' x ¼" Niagara New 1952
10' x ¼" Cincinnati #1810
10' x ⅜" Cincinnati #2510
SHEARS—ANGLE
6 x 6 x ⅝ Hilles & Jones
4 x 4 x ⅝" Long & Allstatter
SLITTERS
24" Yoder Slitting Line
36" Paxon Slitting Line
42" Illinois, 4½" Shaft Dia.
STRAIGHTENERS
No. 3 Medart 3 Roll Capacity to 4½" Tubing
Kane & Roach Roll Straightener & Cut-off Capacities 7/16" to ⅞" Hex Bars
SWAGING MACHINES
#4 Fenn, Capacity 2¼" Tubing, LATE
#6½A Fenn, Capacity 2¾" Tube 3¾" Solid 10" Die Length Hydraulic Feed, LATE
WIRE MACHINERY
#2 Vaughn 12 Die Continuous Wire Drawing Machine Capacity 14 to 27" B&S Ga.
4—Block Vaughn Wire Drawing Machine 22" Diameter Blocks

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RE-NU-BILT
GUARANTEED
ELECTRIC POWER EQUIPMENT
A. C. MOTORS
3 phase—60 cycle

SLIP RING

Qu.	H.P.	Make	Type	Volts	Speed
2	1750	G.E.	M-579BS	4800	1800
1	1500	G.E.	MT	6600	1187
1	1100	F.M.	OVZK. B.B.	4800	1800
1	800	G.E.	MT	2300	293
1	750	G.E.	MT-573	2200	1190
1	700	A.C.		2300	500
1	500	Whse.	CW	550	350
1	400	Whse.	CW	440	514
1	350	Cr.Wh.	Size 71	208/416	1765
1	350	G.E.	IM-17A	440/2200	720
1	250	G.E.	MT-424Y	4000	757
1	250	Cr.Wh.	Size 290	2300	350
1	250	Al.Ch.		550	600
1	200	G.E.	IE13 B-M	220/440	1760
1	200	G.E.	MT-557Y	220/440	1760
1	200	Cr.Wh.	20QB	440	505
1	200	G.E.	IM	440	435
3	200	G.E.	I-17AM	2200	435
1	200	G.E.	IM	2200	580
1	150(unused)	Whse.	CW	2306	435
1	125	A.C.		440	865
1	125	Al.Ch.		440	720
1	100	G.E.	IM-10	2200	435
1	100	G.E.	IM	440	600
4	100	A.C.	ANY	440	695

SQUIRREL CAGE

1	800	G.E.	KT-573	2200	1180
1	650	G.E.	FT-559BY	440	3570
3	500	Whse.	CS-1216	2000	500
2	450	Whse.	CS-1420	2300/4150	354
1	400	G.E.	IK	2200	500
1	300	G.E.	KT-559A	2300	1775
1	200	G.E.	IK-17	440	580
2	200	G.E.	KT-557	440	1800
1	150/75	G.E.	IK	440	900/450
1	150	Whse.	CS856S	440	880
1	150	Whse.	CS	440	580

SYNCHRONOUS

Qu.	H.P.	Make	Type	Volts	RPM
1	7000	G.E.	ATI	2200/6600	600
1	4250	C.W.	8501SL	4000/6900/13800	514
1	2850	Whse.	Sp.f	2300/4600	514
1	2800	Whse.	Sp.f	2300	720
1	2000	Whse.		2300	102
2	1750	G.E.	ATI	2300	3600
1	735	G.E.	ATI	2200/12000	600
1	450	Whse.		2200	128.5
1	325	G.E.	ATI	440	1800
1	225	G.E.	ATI	440	1800
1	100	G.E.	TS-7558	220/440	900

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47 Howell Street, Jersey City 6, N. J.

2000# Chambersburg Pneumatic Forging Hammer, Late Type, Serial 20CH392L7.

4000 lb. Chambersburg Double Frame Steam Forg. Hammer

2500 lb. Erie Single Leg Steam Forg. Hammer

Pels FV-75 All Steel Billet Shear Cap. 7⅝" Rd.

United Engineering & Fdry. Alligator Shear Clutch operated; Cap. 6½" Sq.

3—2-ton Denison Auto. Hopper Feed & Index Table Hydr. Multipress

2500 lb. Model E Chambersburg Steam Drop Hammer, New 1944

6' x 10 ga. Cincinnati Squaring Shear ¼" x 8' Pexto Gate Shear; 20" throat

4" National High Duty Upsetting & Forging Machine, air clutch, also one with regular clutch, also 1", 2", 3" air clutch

Williams White Bulldozers from 5-ton to 300-ton

Landis Landmaco and other Landis Threading Machines

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No. 3 Motch & Merryweather Saw, with Saw Grinder

No. 3 Waterbury Farrel Progressive Header, Cap. ½"; 4 stations and 1 cutoff

BOLT, NUT AND RIVET MACHINERY, COLD HEADERS, THREAD ROLLERS, THREADING MACHINES, TAPPERS, COLD BOLT TRIMMERS, SLOTTERS, HOT HEADERS AND TRIMMERS, COLD AND HOT PUNCH NUT MACHINES.

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REBUILT — GUARANTEED ELECTRICAL EQUIPMENT

COMPLETE PACKAGE MILL DRIVE IN STOCK

(1)—800-HP., Whse. motor, 168 R.P.M 710 VDC, sep. excited fields
(1)—720/850-KW Whse. M-G Set 600/710 VDC Diff. Comp. driven by a synchronous motor 900 R.P.M., 4000/2300-volt, 3 phase, 60 cycle
(1)—Starting panel for syn. motor
(1)—4 unit exciter set
(1)—Set of variable voltage control

IDEAL REEL DRIVES

(2)—600-HP Allis-Chalmers mill motors, 600-VDC, 300/600 R.P.M., with a 1200-KW, 600-VDC Westinghouse M-G Set, 1750-HP synchronous motor, 4160/2300-Volt, 3 phase, 60 cycle.
(2)—275-HP Westinghouse mill type motors, 230-Volt, 425-850 R.P.M., with 2 or 3-unit, 600-KW M-G Set, 250-VDC and 900-HP synchronous motor, 2300-Volt, 3 phase, 60 cycle.

SPECIAL

1450 KW double armature Whse. Generator, 600 VDC, 900 R.P.M. separate excited fields, with 2250 HP, syn. motor, 2300/4000 volt, 3 phase, 60 cycle

MOTOR GENERATOR SETS

Qu.	KW	Make	RPM	D.C. Volts	A.C. Volts
5	1500	Al. Ch.	514	350/700	13800/6000/4160
5	1500	G.E.	514	250	2300/4000
1	1450	Whse.	900	600	2300/4000
2	1250	Al. Ch.	720	600	2300/4000
1	850	G.E.	720	240/350	2300
1	725	Whse.	900	600	2300/4000
1	500	Cr. Wh.	720	600	2300/440
1	500	G.E.	900	250	2300
4	300	Whse.	1200	125/250	2300
1	300	Al. Ch.	1200	250/300	2300
(3-unit)					
2	200	Whse.	1200	125/250	2300/440
2	150	Rel.	1200	125	2300/440
1	150	Whse.	1200	125/250	2300/440
1	150	G.E.	1200	250	4600/2300
1	100	Whse.	720	125/250	220
1	75	Whse.	1200	125/250	2300

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4302 Clarissa St., Philadelphia 40, Penna.
Cable Address "Macsteel" Philadelphia, Pa.
Phone Davenport 4-8300

Cinn. 10" x 18" Plain Grinder, 1938.
No. 57 Hardinge 2nd-oper. Lathes.
No. 59 Hardinge 2nd-oper. Lathes.
No. 103 Grant Spinners.

D. E. DONY MACHINERY CO.
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800 TON MILES WHEEL PRESSES

(2) Late Type 800 ton Wheel Presses, 96" between bars; max. dist. ram and resistance head 9'3" wgt. each 65,000 lbs.
(1) 32" Ohio Dreadnaught Shaper, M. D.

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Compressor, 5HP Brunner 150# Tank Mounted
Leveller, 3" x 30" Fessler Backed Up Type
Metallograph, B&L Mils, 5" x 8" Camera
Riveter, 50 Ton Hanna Hyd., 8"R x 16"G 10 HP
Rolling Mill, 20" x 30" United 2HI, RLR BG
Rolling Mill 6" x 8" Standard 961, RLR BG
Rolling Mill 6" x 5" Std Grading, RLR BG

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30 Church Street New York 7, N. Y.

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AVAILABLE EQUIPMENT

2—18" & 37" x 36" 4-HI HOT STRIP MILL STANDS complete with Rolls, Chocks, Bearings, Spindles, Pinion Stand, Motor-Operated Screwdown, etc.

1—BAR MILL—consisting of 2-Stands 16" 3-Hi Mills with AC Motor and Gear Drive, Pinion Stand, Rolls, etc. 4-Stand (3—3-Hi and 1—2-Hi) AC Motor, Pinion Stand, Rolls, etc. Hot Run-Out, Shears, Saws, Straighteners, etc.

1—BAR MILL—consisting of 3-Stands 3-Hi 12" Mills. Top & Bottom Screws, Housing Fillings, Bed Plate, Spindles & Coupling Boxes, Pinion Stand and 750 H.P. DC Motor.

Write for the Curry List of available steel plant equipment

1—#3½—42" Yoder SHEET SLITTER. New 1948. Arbors—0" diameter. Complete with Entry & Delivery Pinch Rolls. Including 65 Knives (practically NEW) and 150 Spacers/Capacity—4 cuts in ¼" mild steel.

1—36" Paxson SLITTING LINE. Complete with Pay-Off Reel, Slitter, Re-coiler, Scrap Baller, Motor-Generator Set & Controls. Slitter Arbors—4½" diameter. Capacity—4 cuts in 3/16" mild steel.

ALBERT Curry & CO. INC.
STEEL PLANT EQUIPMENT
941 OLIVER BUILDING - PITTSBURGH 22, PENNA.
Phone ATlantic 1-1370

1—⅜" x 53" CUT-TO-LENGTH LINE. Including Pay-Off Reel, 5-Roll Leveller (6½" Diameter rolls) with Pinch Rolls, Loop Table, Up-Cut Shear, Run-Out Table and Electrics & Controls.

1—42" BACKED-UP ROLLER LEVELLER, McKay. Rolls 2½" diameter x 42" face. Including AC Motor and Controls.

1—2000 H.P. General Electric MOTOR, Slip Ring, 3/60/2300 volts, 237 RPM. Complete with Controls

1—2000 H.P. Mesta GEAR REDUCTION UNIT. Ratio 10 to 1. 23.7 RPM Output.

1—DOUBLE HEAD GAG PRESS. Manufactured by Sutton Engineering, 1945. Model K-350. Capacity 1½" square.

Cable Address: CURMILL-PITTSBURGH

HIGH GRADE TOOLS

7½" National high duty air clutch forging and upsetter
4" National high duty upsetting and forging machine, late (2)
3"-3½" Ajax upsetting and forging machine, steel frame
3" National high duty upsetter, air clutch
3" Ajax upsetter, air clutch
1½" National upsetting and forging machine, hardened ways (2)
Economy Type R automatic threading or pointing machines, 1948 (2)
10½" x 10½" No. 3 Motch & Merryweather cold saw, late, MD
10" x 10" Racine hydraulic Shear-Cut metal saw
750 ton No. 3 National Maxipress, air clutch, new 1945
60 ton No. 600 B Perkins OBI press, new 1950
800 ton Model 2E48-800 Hamilton straight side single crank, air clutch
250 ton Williams White & Co. four post upward working hydraulic press
150 ton HPM Hydro-Power Electrozinc hydraulic press
350 ton No. 18T Cleveland single crank double action toggle drawing press
260 ton No. 795½-72 Toledo double crank toggle drawing press
200 ton 7-72" Bliss double crank straight side tie-rod frame press
126 ton Model 60-D-66 Cleveland straight side double crank tierod frame single geared press
[illegible] ton [illegible] Toledo [illegible] straight side joint reining press
400 ton No. EG 54 Ferracute upward working reining press
30" x 30" x 8' Cincinnati Hydro 2 rail, one right hand side head, dial feed planer
Economy type KK automatic bolt head shaving and pointing machine

Ask for your list No. 206

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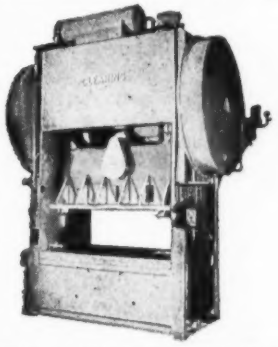

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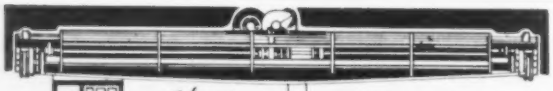

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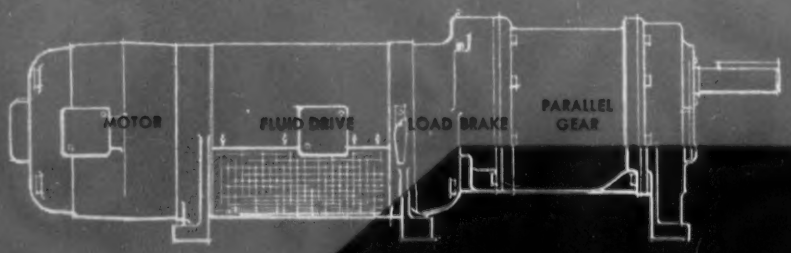

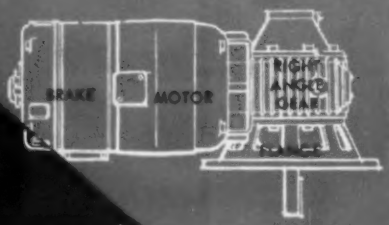

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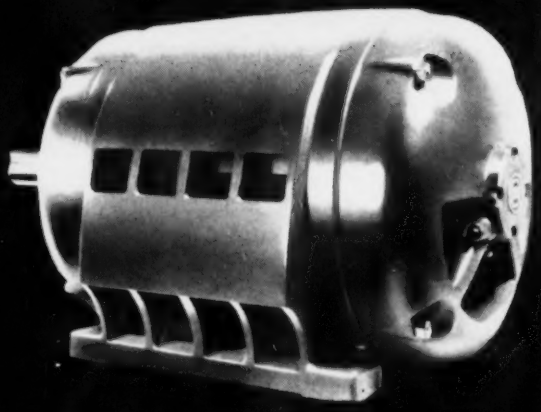

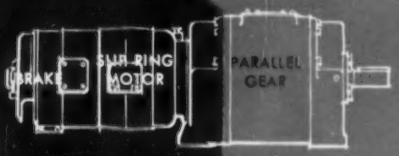

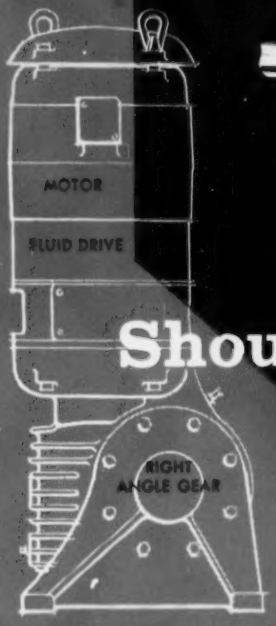

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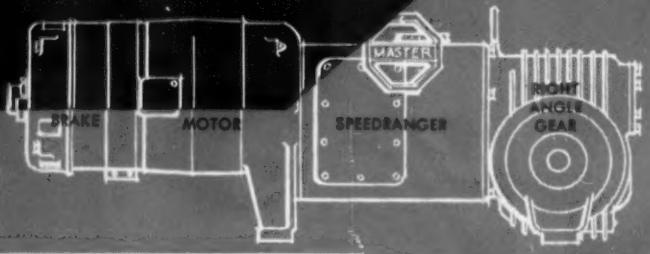

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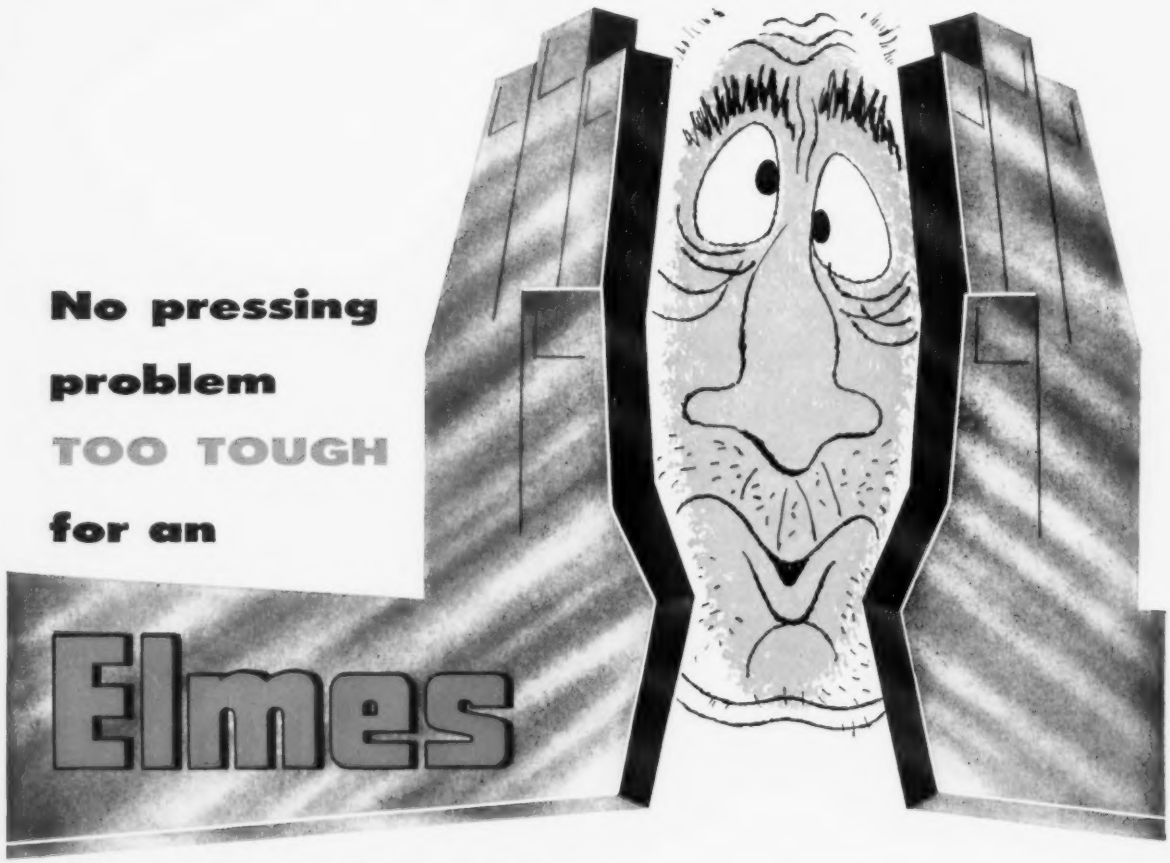

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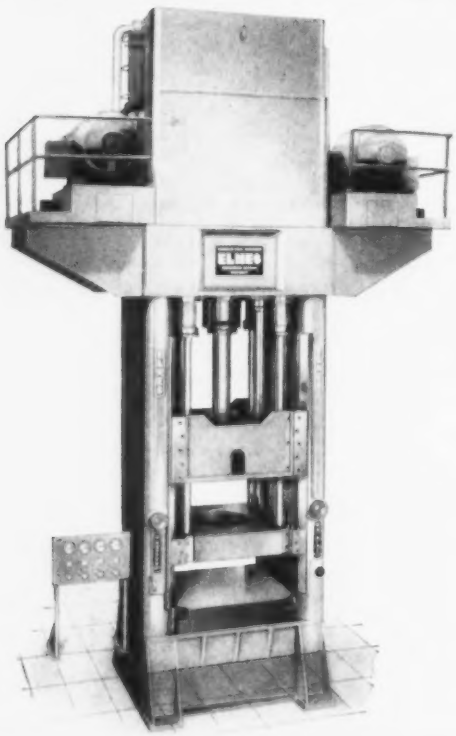

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